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THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

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Quick service.

Return a whole sheet for an inch of fault.

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To PRESIDENT ROOSEVELT,
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(Signed) LIEUT. ALBERT S. JONES,
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CAHALL BOILERS See Page 128.

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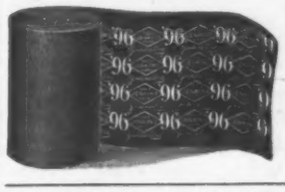

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Makes perfect joint instantly; does not have to be followed up. Makes joint that will last for years on all pressures of steam, oils, acids, &c. Does not rot, burn, blow or squeeze out. Received the highest award—**Gold Medal**—at the Pan-American Exposition.

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For Sale High Grade Basic Open Hearth Steel Billets and Slabs
THE AMERICAN TUBE & STAMPING COMPANY
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SEE PAGE 27.

MAGNOLIA METAL.
Best Anti-Friction Metal for all Machinery Bearings.
Fac-Simile of Bar. Beware of Imitations.
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Owners and Sole Manufacturers, 511-513 West 13th St., NEW YORK.
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Best Bronze, Babbitt Metals, Brass and Aluminum CASTINGS On Short Notice.

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SPRINGS IN LARGE OR SMALL QUANTITIES TO ORDER.
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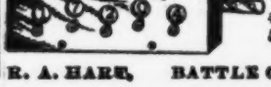
No better coupler made.
4 Wheel, $3.00
5 Wheel, $3.25
Guaranteed.
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THE IRON AGE

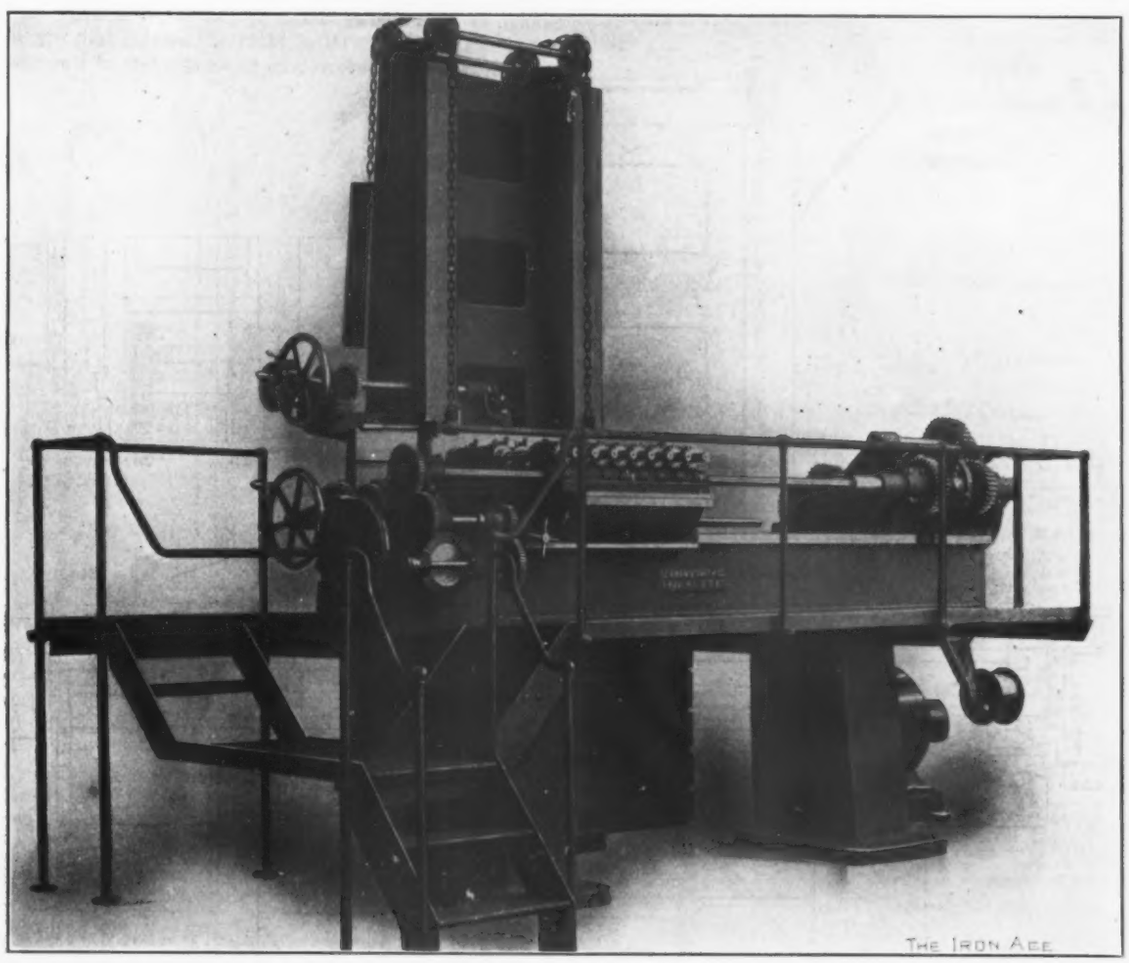
THURSDAY, AUGUST 20, 1903.

The Beaman & Smith Special Drilling Machine.

The Beaman & Smith Company of Providence, R. I., have designed for the International Steam Pump Company a special machine for drilling, counterboring and tapping surface condenser head plates. It consists of an upright about 15 feet high, on which is carried a table about 7½ feet square, which has the necessary clamps for clamping the plates. These plates are circular, and from 18 to 78 inches in diameter. The 18-inch heads have 102 ⅝-inch tubes spaced 1 inch, while the large heads have 1640 1-inch tubes spaced 1½ inches. The arrangement of the tubes and the method of applying them are clearly shown in Fig. 4. In front of the table is a bed and two uprights, on which is mounted a saddle, which has a cross movement with a special indexing arrangement with change gears, allowing one revolution of the index wheel for spacing 1, 1⅛ or 1½ inches. The vertical index for the table has an index to the left hand side of the upright and which, by compound gearing, indexes the cosine of an equilateral triangle either 1, 1¼ or 1½ inches. Both index wheels are reached from the platform shown at the end of the machine.

Each spindle is driven by a spiral gear, and on the end of the spindle is fitted the company's well-known safety drill and tap holder, which allows the tap to slip when it brings up on the bottom of the hole. The construction of the spindle is shown in Fig. 5. It also permits of the easy removal of drills, counterbores, &c., from the position a man would necessarily have to take on the upper section of platform directly back of the spindles. When the spindles are set 5 inches, center to center, the machine operates on every fifth hole of 1-inch centers. With the 4½-inch center distances it operates on every fourth hole 1⅛-inch centers and every third hole of the 1½-inch centers. The slight change of speed necessary in driving the spindles for each of the different diameters, also the difference in material—some being brass and some cast iron—is effected by change gears.

Owing to the great weight of these heads provision is made on the counterbalance for receiving a like casting as is placed upon the table to be operated upon. At the position of the table shown in the illustration a solid head would be placed on the table and a solid one on the counterweight. As the head is elevated and is operated upon, every row of holes makes it lighter, giving a preponderance of weight on the back of the machine. When the next one is operated upon, with the table at the top of the column, the one that was previously drilled, counterbored and tapped is placed on the counterweight, thereby giving the preponderance of weight on the table to index downward. The machine is driven by a 15 horsepower electric motor.



THE BEAMAN & SMITH SPECIAL DRILLING MACHINE.

The C. Pardee Works of Perth Amboy, N. J., manufacturers of turned and polished shafting, cold drawn shafting and finished shapes, have established an office and warehouse at 14 North Fifth street, Philadelphia, where a stock of shafting and finished shapes will be carried. John A. Fernley is resident manager.

Talks with Lawyers on the Labor Question. I.

Some of the most eminent lawyers who have studied the labor question, and who have distinguished themselves by keeping their clients out of trouble, are inclined to believe that labor difficulties have been greatly aggravated by the confusion that exists in the minds of the people regarding the respective rights of employers and workingmen. There even appears to be serious confusion over the first and simplest question involved, What is a strike? The Courts have adopted various definitions, all of which seem to be out of line with the experience of employers.

The Courts have universally recognized and sanctioned the right to strike. The most sacred duty of the Courts in the United States and other English speaking countries, where the common law prevails, is to defend and maintain the liberties and rights of the individual and, in recognizing the right to strike, the Courts are merely defending the workingman in his right to work or not to work. The right of association is one of the rights of the individual that are fully recognized under the common law, and hence men have a right to quit work in a body and refuse to work until the employer offers wages or conditions that are satisfactory to them. It is immaterial whether the demands of the men are just or

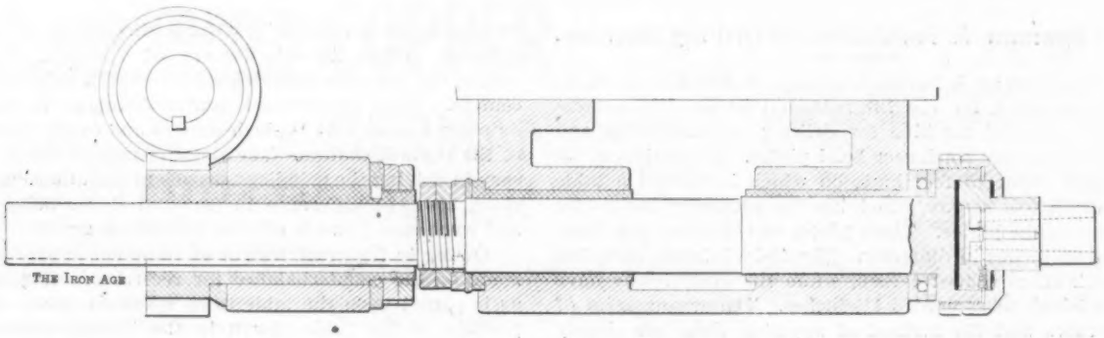


Fig. 5.—Section of Spindle.

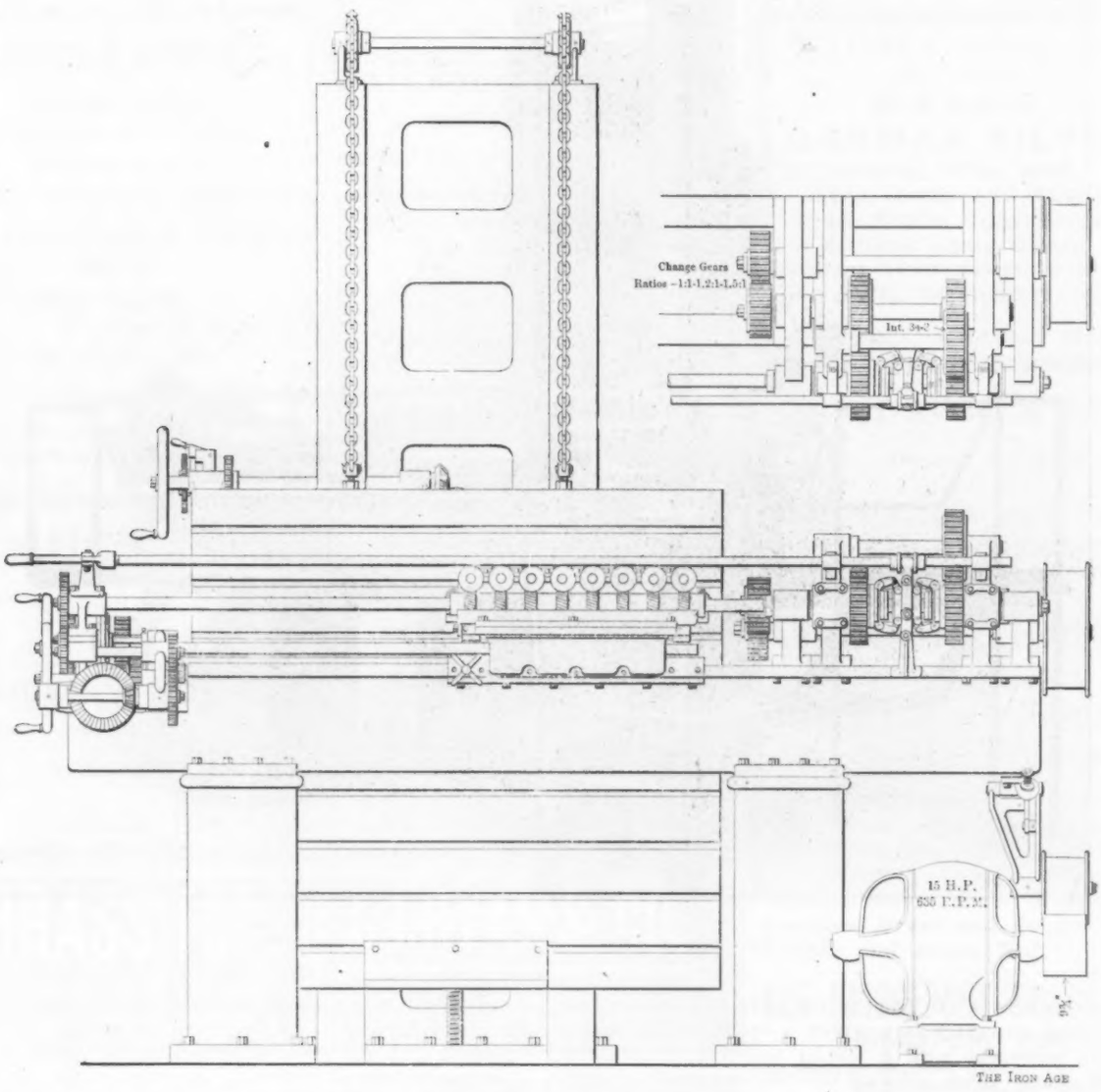


Fig. 2.—Front Elevation.

THE BEAMAN & SMITH SPECIAL DRILLING MACHINE.

not, they have the right to quit, which no Court can deny them. It is only this right to quit work that the Courts have recognized as the right to strike.

The kind of a strike that the employer has to deal with is a vastly different proposition from the strike that is recognized by the Courts as a lawful act. To the eye of the Court it appears that the essential feature of a strike is the act of quitting work. The employer finds that this is only the first or preliminary step, and the essential feature, from this point of view, is what the men do to prevent others from working, and to prevent him from carrying on his business, after they have quit and have no further interest in the business. The employer, whatever his business may be, is in business primarily to make money. He finds that a strike is a continuous campaign of acts calculated to injure his business and prevent him from making money, until he complies with the demands of the strikers. If the men did no more than quit work, the labor question would cause him little trouble.

It would seem that there are two kinds of strikes—passive and active. The passive form, a peaceable cessation of work and refusal to work, exists only in legal literature that defines the right to strike. It is practically unknown in the affairs of employers and workingmen. The active form begins where the passive ends, and is the almost universal form that strikes assume. The shops are picketed to prevent other workingmen from entering or approaching the place in search of employment, and if persuasion is not enough to keep men away, the pickets assume both police and judicial powers, using force to prevent men from working, and sentencing them to punishment, which is administered on the spot, if they persist. Teamsters and other workingmen whose employment brings them into contact with the offending employer are asked to refuse all business relations with him. Pressure is even brought to bear upon the family of the man who persists in working. Whenever there is

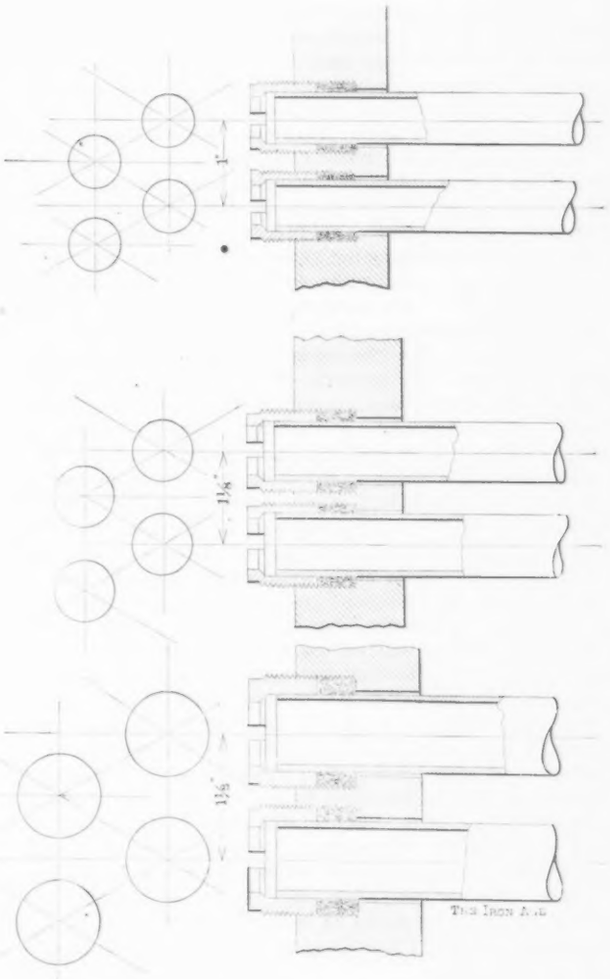


Fig. 4.—Arrangement of Holes.

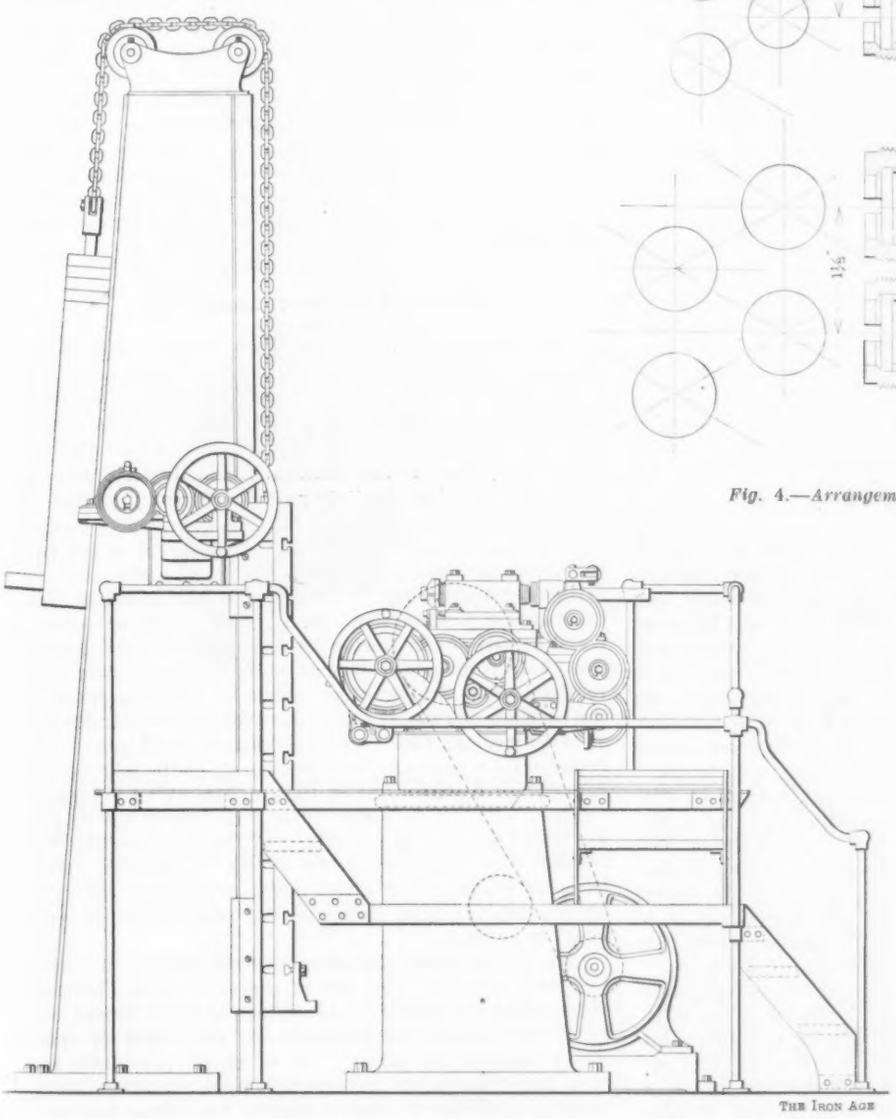


Fig. 3.—End Elevation.

THE BEAMAN & SMITH SPECIAL DRILLING MACHINE.

a prospect that the measure will be effective in injuring the employer, persistent efforts are made to keep people from buying his goods or doing business with him—the boycott. These are a few essential features of the active strike that is confronting employers everywhere.

It seems that employers have made no serious effort to get this problem before the higher Courts and obtain a more exact definition of a strike. They have wrestled with the problem the best they could, on a basis of wiggle, temporize and compromise, without knowing just what their rights were. Business men are not allowed to picket or boycott their competitors, and their associations cannot interfere with any one who refuses to conduct his business in the manner which they wish to dictate. Business men, in fact, are not allowed to do anything, individually or through organized efforts, to willfully injure any person or to interfere with any one in the pursuit of his occupation. The same rule should apply to workingmen and their organizations.

Our Courts are the most conservative institutions that we have. It is their duty to protect the weak against the unjust aggressions of the strong. When the factory system wiped out the old personal relations between the employer and the journeyman or laborer, and made the employment of hundreds or even thousands of men subject to the will of one employer, our Courts, in the course of 50 years, developed the doctrine that the workingman was the weaker party in labor disputes, and they extended to him every indulgence which the law allowed, while, at the same time, the employer was held strictly to account for any illegal abuse of the power which the factory system gave him. Our Courts of to day have been following the precedents established during the early period of the factory system, but it would seem that, with the growth of the power of labor organizations, new conditions have arisen which demand a readjustment of judicial policy. This can only be brought about by carrying the facts to the highest Courts, and if employers feel that existing conditions are a menace to the industries of the country it would seem as though some such action should be taken. We are a lawabiding people, whether we work at a bench or a desk, and many of the grievances of both the employer and the workingman would disappear if we only knew what was right.

Pacific Coast News.

San Francisco, August 10, 1903.—Later returns of the harvest, which is still in progress, give a smaller yield of wheat and barley than had been estimated, but the market for wheat continues to advance, and farmers are satisfied. Indeed, very little wheat or barley has come to hand yet, and this is especially true of wheat. The crops of all descriptions were late in maturing this year, and this has kept business back a little, but the volume of sales in hardware, iron and steel has not fallen behind the average of any other year.

Although our hardware houses have ceased to say much about the bids for Indian supplies, they have not been idle. It has been placed in the hands of the officers of the Manufacturers' and Producers' Association of this city for final settlement, and it could not be in better hands. A gentleman speaking for the merchants as a whole had this to say to your correspondent about the matter: "Bids on about 680,000 pounds of sugar were opened at Chicago on April 16. Bids on sugar were made by Haas Bros. of this city, and after adding to the price here the cost of transportation to Omaha and the point of distribution their bid was the lowest, but was rejected. The Indian Office issued, through the press, a statement that it was ignorant of the existence of commodity rates on sugar, and that the mistake being occasioned thereby the matter could not be helped. However, exercising their right, they cut down the quantity awarded to the sucessful bidder 25 per cent. and gave that to Haas Bros. Following this the annual opening of bids took place at San Francisco June 16, and here, under the conditions of competition, our bidders were unusually successful. In general their prices were very low, but the Commissioner saw fit to disapprove the action of the Indian Office at San Francisco. In the award of this office were barbed wire, wire nails, stoves, iron beds, &c. The Manufacturers' and Producers' Association of California have taken the matter up with the Commissioner and with the Secretary of the Interior, and have submitted the facts to the Department. By this report it is shown that reconsideration should be had of the disapproval of the award. Among other things in this report is pointed out the fact that San Francisco prices are lower for the grade of goods offered, which is that generally purchased here, and that this being so the prices are not unreasonable in comparison with the others when quality is considered. In fact, following the usual custom, the Indian Office made contracts here at higher prices than the others were offered at, based on the ground of difference in quality and fitness. In the case of barbed wire purchased here, the light wire was offered at $3.31 per 100 pounds, which is lower than actual cost to large jobbers by 5 cents per 100 pounds. The Chicago price is $2.74, but adding cost of freight to San Francisco and that of reshipping, the cost when bought in Chicago amounts to $3.46 per 100 pounds. The base price on wire nails at San Francisco was $2.71 per 100 pounds—the flat cost to the largest jobbers. The Chicago price was $2.09, but when freights are taken into account the same result is reached as in the case of barbed wire. In other cases the Commissioner awarded the contracts here for good, serviceable articles in accordance with previous custom where a less serviceable article could be laid down at lower prices here. The award for agricultural implements was made here without reference to lower Chicago prices, it being clearly impossible in several cases to determine merits without a comparison of samples. The Manufacturers' and Producers Association have therefore submitted statements showing to the department that prices laid down in San Francisco are in every way reasonable, and that the awards of the local office should be approved." J. O. L

The Stiles-Morse Company.

The Stiles-Morse Company, 16-18 South Canal street, Chicago, Western exclusive distributing agents for the E. W. Bliss Company, report a very satisfactory business for July, having during the month sold the entire equipment for two new independent can factories and also for a new competitor of the National Enameling & Stamping Company, entering the lists as a large manufacturer of enameled ware, the Coonley Mfg. Company of Chicago, who are located on the Belt Line. The larger of the two can factories equipped during the past month by the Stiles-Morse Company is that of the Norton-Edgar Can Company of Ludlow, Ky. H. M. Norton will be remembered as one of the Norton Bros. who sold to the American Can Company the largest plant manufacturing cans in the United States, after which he was appointed to the position of general sales agent for the central district of the American Can Company, located at Chicago. His resignation a year ago and decision to again take up the gauntlet as a competitor of the American Can Company, together with M. W. Edgar, also formerly of the American Can Company, is significant of the fact that there is considerable confidence being shown in existing conditions as influenced by sheet metal production, the present manufacturers of cans, and the consumption of sheet metal in general.

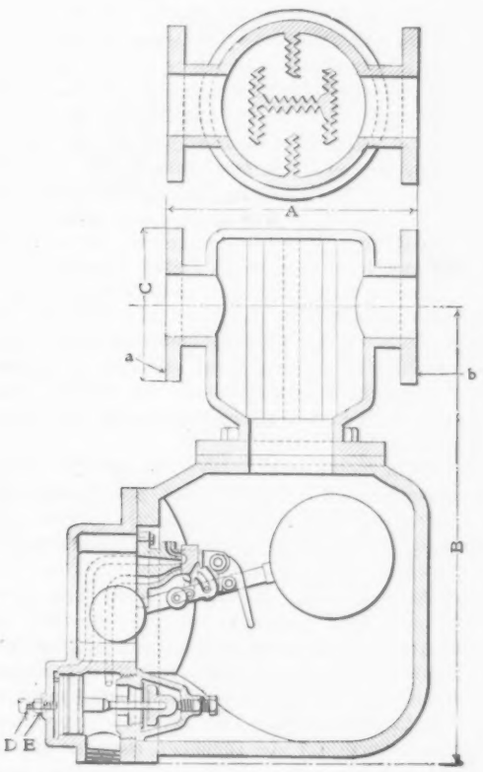
The Stiles-Morse Company of Chicago are a young company, organized the first of the year for the purpose of handling the Western business of the E. W. Bliss Company, the largest manufacturers in the world of sheet metal working machinery. E. S. Stiles, president, has been identified with the manufacture of sheet metal working tools for the past 18 years. Mr. Stiles was with the Stiles & Parker Press Company of Middletown, Conn., until that concern sold out to the E. W. Bliss Company, Mr. Stiles remaining with the Bliss Company for five years. A. A. Morse, secretary and treasurer, was formerly a manufacturer of cans, his company selling out to the American Can Company. Both gentlemen were with the American Can Company from its formation until taking up their present position.

The Stiles-Morse Company have introduced rather an innovation in the sheet metal working machinery line,

as they are carrying in their showroom in Chicago in the neighborhood of 100 Bliss tools at all times. Heretofore it would have been difficult to have located over five machines of this description in an individual stock on Canal street. The company report the outlook for future business very favorable.

The Wyoming Automatic Eliminator.

The Wyoming automatic eliminator, built by W. H. Nicholson & Co. of Wilkes-Barre, Pa., is intended to remove from the steam all loose water, and as much entrained moisture as may be possible within the limits of practical mechanical construction. It is also intended to prevent the eliminated water from being siphoned or otherwise carried back into the steam at delivery and to prevent wire drawing, condensing or otherwise reducing the steam pressure. The water, grease and other extraneous matter is automatically discharged without loss of steam. The construction of the device will be readily understood from the accompanying half-tone and sectional drawing. The separation takes place in the upper chamber, being aided by the arrangement of corrugated baffle plates. The water runs to the lower compartment, from which it is automatically discharged upon reaching a certain hight. The apparatus takes care of any quantity of water from a "drip of condensation" to a "flood."



THE WYOMING AUTOMATIC ELIMINATOR.

New Iron Hardening Process.

Consul-General Oliver J. D. Hughes, Coburg, makes the following report to the Department of Commerce and Labor:

Phosphorus, as is well known, has the property of imparting a certain degree of surface hardening to iron, but not without producing brittleness. The iron is made to assume a coarse structure, in which the crystals are comparatively loosely bound together. This effect of phosphorus of loosening the coherence of the molecules of the iron greatly facilitates the absorption of carbon by the iron. The carbon rapidly penetrates the iron to a considerable depth, imparting great toughness to the core and nullifying the comparatively slight defect constituted by the inconsiderable brittleness of the surface. Two Prussian inventors apply this principle in their process for hardening iron by heating the same in a tempering powder consisting of organic nitrogenous substances containing a high percentage of fusible ash and employing phosphorus as the medium for the introduction of carbon into the iron. Without prejudicially affecting the welding properties of the iron, it imparts such a degree of hardness thereto that it can neither be cut nor chipped by the best steel used. In order to harden the surface of about 200 kg (441 pounds) of iron to a depth of 1 mm. (0.0394 inch) by means of this process, the pieces should be imbedded in a retort, muffle or the like in bone dust, to which is added a mixture of 300 grains of yellow prussiate, 250 grains of cyanide of potassium and 400 grains of phosphorus. The receptacle is well closed, luted with clay, &c., and raised to a clear red or white heat, whereupon the material treated is immersed in a glowing condition in a water or other bath.

The Niagara Transfer Company, who were incorporated last December, have perfected plans for a railway transfer system on the Niagara River below Buffalo which will afford all Canadian lines direct connection with lines running east from Buffalo and the Niagara frontier. A railway bridge is to be built across the Niagara and large switching grounds established. In all something like 20 miles of track will be laid, connecting the transfer yards with the various Eastern lines. The company have purchased or optioned lands along the river front from the International Bridge to Rattle Snake Island, and track connections to cover about five miles of river frontage will be laid. At a meeting held for the election of directors the following were elected: Hon. James A. Roberts, Edward Michael, Jno. C. Conway, Senator T. Ellsworth, Tracy C. Becker, Isadore Michael, Henry Woods, S. T. Franchot and H. W. Alvord.

In small cities the condition of union men is pitiable where strikes are instituted, and the wonder is how they can avoid becoming public charges. The much vaunted strike support allowances from the unions to their members do not materialize. As too many working men do not lay up anything, no matter what wages they receive, they must either get credit from butchers and grocers or go hungry.

Boiler and Furnace Efficiencies.*

BY A. BEMENT. CHICAGO.

It is not the object of this paper to treat of boiler and furnace efficiencies in general, but to discuss some features of the performance of modern standard apparatus. For this purpose two types of boilers, two furnaces and one stoker have been selected; one of the boilers, however, owing to changes made in it, may be considered as a third type. One of the boilers is 12 tubes high and 16 wide, provided with a superheater and rated at 400 horse-power. It is equipped with a chain grate stoker of 65.5 square feet; the gases from the fire discharge among the tubes of the heating surface located immediately above, thence down across the tubes of the second pass, and finally rise on the way to the flue across the tubes of a third pass. This boiler is referred to as boiler *A*. The other boilers are of two sizes. That designated as No. 1 is 15 tubes high and 19 wide. No. 2 is 17 tubes high and 19 wide. With each the gases travel from the bottom of the back and diagonally across the tubes to the upper front end, thence back between the drums to the flue. No. 3 adjoins No. 2 in battery, and is identical with it except that the path of the gases from the back end is forward among the lower tubes of the second to the seventh rows; thence to the front end of the boiler, then back among the next five rows and finally forward among the upper five rows, where they pass between the drums to the flue. In this arrangement the gases traverse the length of the tubes three times in place of the one diagonal travel of boilers Nos. 1 and 2. The furnaces under these boilers are identical, and each is fitted with a chain grate stoker of 72.2 square feet. The tubes in the lower row of the boiler are entirely encircled with a fire brick tile from the front to a point back of the bridge wall; for the remainder of the distance to within 4 feet of the back end the usual tile furnished by the maker of the boilers is used.

The expression "boiler efficiency" is used to designate the performance of the boiler only, not that of the combined apparatus; it implies the measure of the cooling effect produced on the hot gases, and neglects radiation and moisture in the steam.

The experimental work herein mentioned had three objects: First, to determine the relative efficiency of boiler A and boiler No. 1; and, second, the relation between the efficiency of the same boilers and their furnaces based on combustion and heat absorption, neglecting loss of combustible in the refuse. The two relative values to be determined were—for the furnaces, the loss due to escaping hydrocarbons and incomplete combustion, and for the boilers the cooling effect produced. With Nos. 2 and 3 it was desired to determine the relative cooling effect only.

The efficiency of a boiler will be influenced by the initial or furnace temperature, and by the capacity at which it is worked. So as the horse-power increases the effect is to lower the efficiency, and as the initial temperature is lower, so is the heat transfer, and as a smaller boiler will absorb less heat than a large one, the determination of its efficiency according to some standard becomes a complicated problem. With the measure of performance of the combined boiler and furnace based on water evaporated from and at 212 degrees, a factor of evaporation has been devised to place different conditions on a common basis, but no factor, or set of factors, has as yet been devised to reduce various boiler performances to any standard of comparison. Therefore to determine the difference in efficiency between the boilers to be compared requires in each case that the amount of heating surface, initial temperature and amount of water evaporated be the same; these requirements being met, it then becomes possible to discover the relative value of the cooling effect produced. These requirements were very closely met in the comparative test between boiler *A* and No. 1, and also between Nos. 2 and 3. In fact, the performance of the four boilers is so nearly on the same basis as to be suitable for comparison.

Table A.

	Boilers.			
	Boiler *A*.	No. 1.	No. 2.	No. 3.
Square feet of water heating surface	4,000	4,340	4,800	4,800
Square feet of steam heating surface	383	....	....	....
Horse-power, standard rating	400	434	480	480
Horse-power, maker's rating	400	570	645	645
Horse-power developed	442.8	431.5	564.3	580.4
Horse-power developed above standard rating, per cent	10.7	....	17.6	20.9
Horse-power developed below standard rating, per cent	...	0.06	...	...
Horse-power developed below maker's rating, per cent	...	32.1	14.3	11.2
Length of travel of gases in contact with tube heating surface, feet	21	13	13.3	36
Temperature of escaping gases, degrees F	480.2	650.5	657	469
Temperature of escaping gases above saturated steam	127.8	273.1	278	92
Temperature of escaping gases above air supply	407.9	580.	582	394
Temperature of saturated steam	352.4	377.4	379	377
Temperature of superheated steam	455.8	...	...	...
CO_2	9.22	7.93	10.7	10.3

Table *A* contains the esential data concerning the boiler trials.

Boilers *A* and No. 1 are practically of the same size, although the horse-power of the latter is rated by its maker 31.3 per cent. above the former. The horse-power developed above that of No. 1 by boiler *A* is 10.76 per cent. and its CO_2 is higher, but, owing to unburned volatile combustible equal to 8.79 per cent. of the total combustible, the condition of combustion is less favorable for this boiler than appears from the CO_2 measurement. The conditions for these two boilers may therefore be considered the same, except that with *A* the saturated steam temperature was 25 degrees lower; for this reason its final temperature has been raised that amount, so that the comparison shall be on the same basis.

In the case of boilers Nos. 2 and 3 the combustion was complete. With No. 2 the air supply and horse-power were slightly less, giving it a small advantage over No. 3.

Conditions of operation being the same, the difference of cooling effect is shown by the difference in final temperature measured above that of the air supply; this referred to the initial temperature, also above that of the air supply, determines the efficiency of the boiler.

Comparative Efficiency.

Fig. 1 illustrates the relative efficiency of the four boilers that are being considered. The initial temperature is shown through a range that covers all attainable conditions. From an inspection of the curves it appears that the efficiencies of boilers Nos. 1 and 2 fall upon the same line, and that of *A*, which varied from the furnace temperature, is from about 4 per cent. at 4000 degrees to 20 per cent. at 720 degrees above the efficiency of Nos. 1 and 2, while No. 3 is more efficient than that of *A*. If, however, it is assumed that Nos. 1 and 2 discharge their gases through an economizer that would reduce the temperature by 200 degrees, then the efficiency of the combined boilers and economizer will fall on the same line with that of the efficiency of No. 3 without an economizer.

The efficiency curves are based on the final temperature being constant through the full range of the initial. To what extent this is true is shown by Fig. 2, which illustrates the relation between initial and final temperature, the curve being plotted from simultaneous measurements. It appears that within usual working ranges the final temperature remains quite constant. The value of the relative efficiencies from the standpoint of fuel sav-

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ing is quite important. It is shown in Fig. 3, the efficiency of boilers Nos. 1 and 2 being taken as the standard.

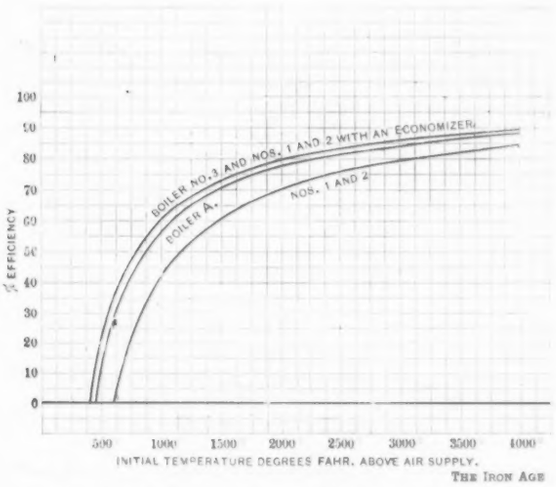

% EFFICIENCY
BOILER NO. 3 AND NOS. 1 AND 2 WITH AN ECONOMIZER.
BOILER A.
NOS. 1 AND 2.
INITIAL TEMPERATURE DEGREES FAHR. ABOVE AIR SUPPLY.
THE IRON AGE

Fig. 1.—Efficiency Curve of Boilers 1, 2, 3 and A.

The value of an efficient boiler when served by an inefficient furnace is forcibly illustrated.

The boiler and furnace of type *A*, having no special features, are not shown, but Fig. 4 is a vertical longitudinal section illustrating boilers Nos. 1, 2 and 3. The heavy arrow shows the path of the heated gases through

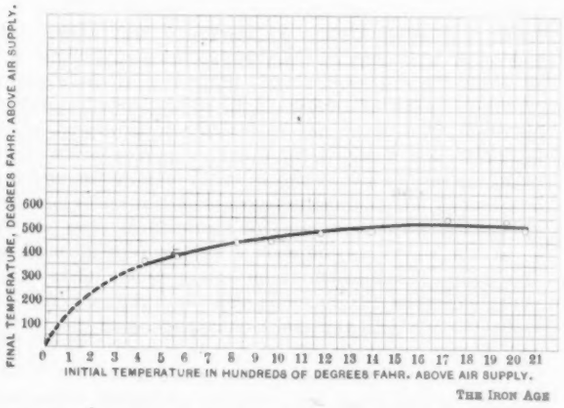

FINAL TEMPERATURE, DEGREES FAHR. ABOVE AIR SUPPLY.
INITIAL TEMPERATURE IN HUNDREDS OF DEGREES FAHR. ABOVE AIR SUPPLY.
THE IRON AGE

Fig. 2.—Relation of Final to Initial Temperature, Boiler 2.

Nos. 1 and 2. The travel in No. 3 is shown by the dotted arrows. The two baffles added in this boiler are indicated by the horizontal dotted lines; the lower of these was located so that between its ends and the back water

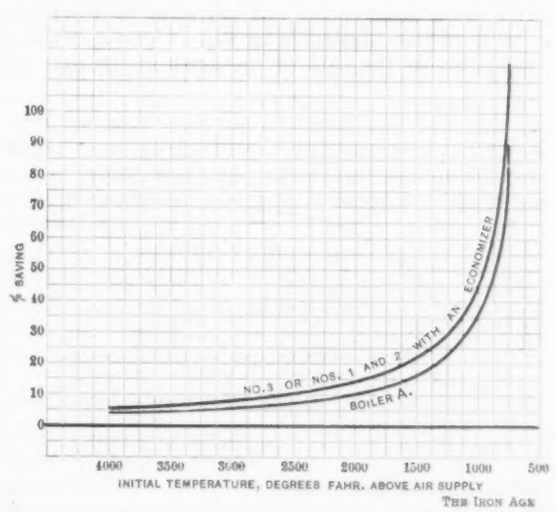


Fig. 3.—Saving Made Over Boilers 1 and 2 by Boilers A and 3.

leg there is a space of 4 inches left open for the full width of the boiler, to allow dust to drop down to the chamber below. Owing to this opening the gas travel is split into two parts, a minor portion taking the more direct and shorter route by way of this opening, as shown by one of the dotted arrows, so, in fact, the effect on the hot gases of the three passes is not entirely secured. Fig. 5 illustrates a section of the tiles which encircle the lower row of tubes and provide a tile roof to the furnace extending beyond the bridge wall. The application of these tiles was devised by W. L. Abbott for reasons that will be discussed later. Fig. 6 shows the tiles which close the spaces between the lower row of tubes back of the encircling tiles. They are those regularly supplied by the maker of the boiler, and leave the

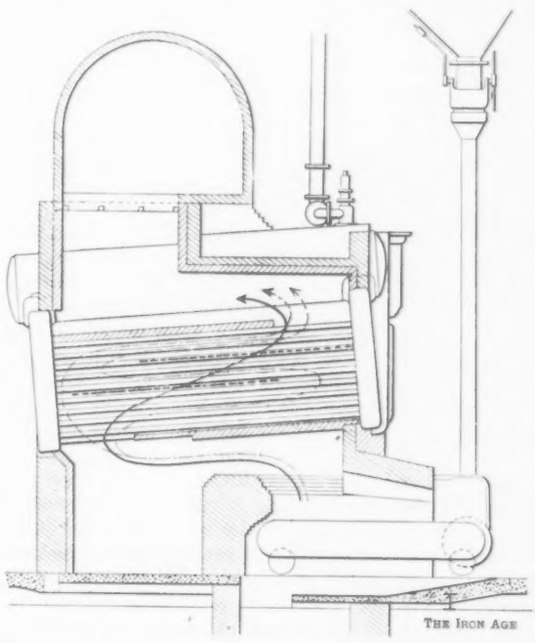


Fig. 4.—Vertical Longitudinal Section, Boilers 1, 2 and 3.

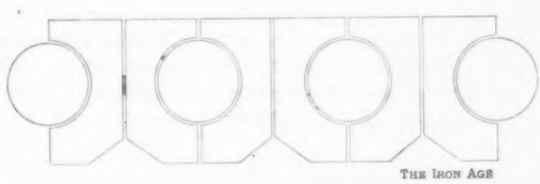


Fig. 5.—Section of Tiles Encircling Lower Row of Tubes.

Fig. 6.—Tiles Closing Spaces Between Lower Row of Tubes Back of Encircling Tiles.

lower half of the tube exposed to the passing hot gas, and are usually known as the T tile.

Table B.

	Degrees F.	Per cent.
Temperature, initial	2,012	.....
" at end of first pass	908	.....
" at top of second pass	680	.....
" at bottom of third pass	555	.....
" at final	480.2	.....
Drop in temperature, first pass	1,107	72.064
" " drums	158	10.29
" " superheater	70	4.59
" " second pass	125	8.16
" " third pass	75	4.896
Totals	1,532	100.000
Horse-power developed in first pass	321	.....
" " in drums	44	.....
" " in superheater	20	.....
" " in second pass	35	.....
" " in third pass	22	.....
Total	442	.....

Inasmuch as there is a great difference in the cooling effect between the boilers compared, it will be interesting to study the reason therefor, and also to examine the drop in temperature of the gases on the way through the heating surface. Regarding this latter phase of the

matter, Table *B* gives in detail the performance illustrated in Fig. 7, which is a curve of temperature drop through the surface of boiler *A* plotted from measure-

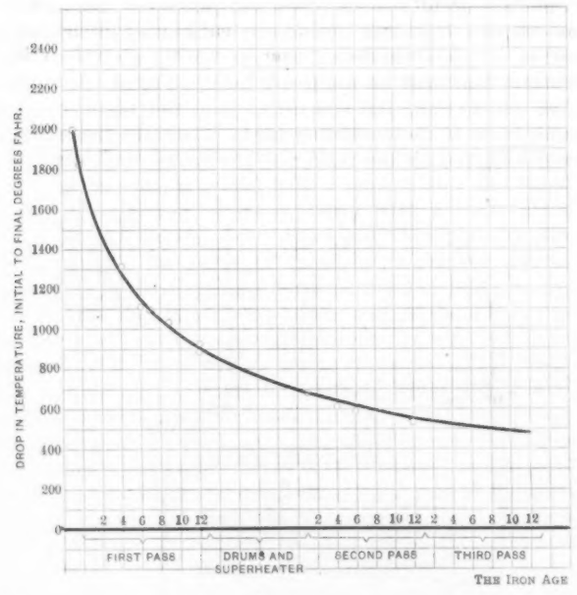


Fig. 7.—Drop in Gas Temperature in Boiler A of 400 Horse-Power.

ments taken during the trial. From this it appears that the same length of travel in the last pass gave only 6.7 per cent. of the cooling effect of the first pass, illustrating the importance of the gases being in contact with the heating surface for as long a period as practicable if large cooling effect be secured. Figs. 8 to 11 show measurements taken among the tubes of boiler No. 2 and also apply to No. 1. Fig. 8 shows prevailing temperature among the tubes 45 inches back from the water leg, from the bottom to the top of the boiler. The measurement at the first, or lowest, stay bolt shows the effect of the heat from the tile roof immediately over the fire. The minimum temperature is between the second and third

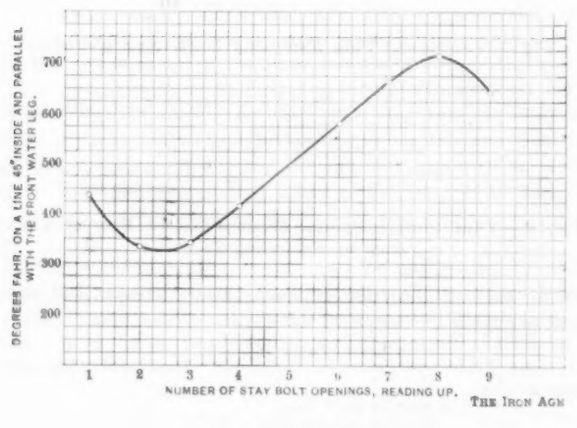


Fig. 8.—Boiler No. 2.

stay bolts; above this it rises until at the point of escape the maximum is reached, showing that on the line of the measurements the highest temperature is at the point of exit. The drop of the ninth measurement is owing to the sudden change in the path of gas travel over the end of the baffle at the top of the boiler, which causes the hottest point to be carried back slightly more than 45 inches at this ninth stay bolt.

Fig. 9 is a curve from measurements taken through the ninth or top stay bolt on a horizontal line, across and beyond the path of the gases at the exit from the tubes; the highest temperature is found at a point 46.5 inches back from the inside face of the water leg. From this point in each direction there is a rapid drop as the distance proceeds.

In Fig. 10 one of the curves shows the percentage of carbon dioxide in the gases on a line 30 inches inside and parallel with the front water leg of boiler No. 2. It will

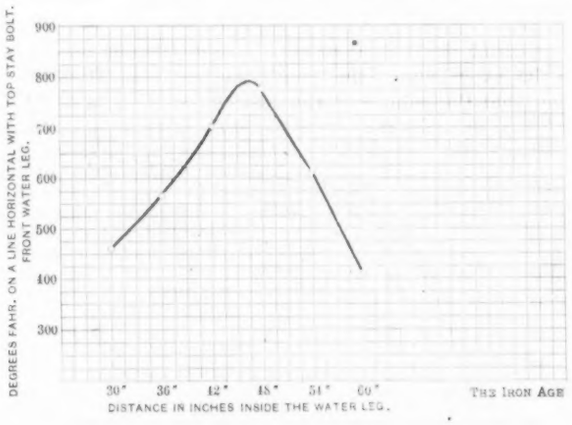


Fig. 9.—Boiler No. 2.

be observed that the measurements in the lowest part of the front of the boiler are extremely low; the first two, however, show the effect of leakage through the furnace roof. The contrast between boilers Nos. 2 and 3 in this respect is remarkable. As analysis showed the CO_2 to be low on account of the presence of air, it is proof that this air must have entered by leakage, and as such leakage

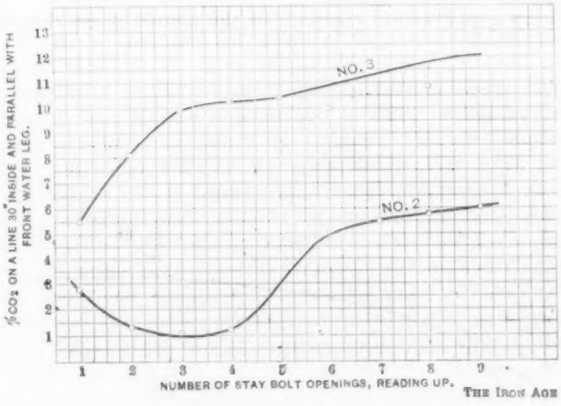


Fig. 10.—Boilers Nos. 2 and 3.

could not be very large it follows that the path of the gases does not extend to the front lower corner of the boiler, or along close to the front water leg. This may be considered proven by the curve of CO_2 from boiler No. 3, subject to the same leakage, but with an arrangement of baffles which caused the flow of the gases to be carried into the front lower corner and nearer to the front water leg. It is further illustrated by Fig. 11, giving CO_2 measurements across the path of the gases at the exit from

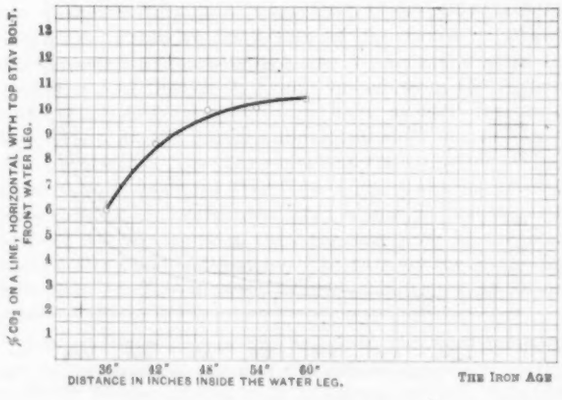


Fig. 11.—Boiler No. 2.

boiler No. 2, showing that the CO_2 increases with the distance away from the water leg. From measurements made through the back water leg of boilers Nos. 1 and 2 it is shown that a similar condition to that in the lower

front corner existed in the upper back corner of the tube surface, but on a reduced scale, showing that with these boilers the back upper corner performs a small amount of work and the front lower corner still less; also that the active portion of the heating surface is on a diagonal line from the lower back to the front upper corners. It shows further that the volume of the moving gas body is of decreasing magnitude as it proceeds, and that as its center is approached the temperature is higher, so it is probable that its center is moving at a much higher velocity than its surface. According to Fig. 9 it would appear that the greater portion of gas was flowing through the space of 1 foot at the front end of the top baffle, and if an opening 4 feet long from the furnace at the lower back corner is large enough, it would follow that a space considerably less at the outlet would answer.

As the volume of the gases decreases rapidly with drop in temperature, it is probable that boiler *A* would be improved by passing the gases across it four times in passages of properly proportioned size, not adding to the amount of heating surface, but bringing more of it into active use; because with this boiler, as with Nos. 1 and 2, the tendency is for the gases to flow in a narrow path diagonally across the tube surface of the pass.

It is apparent that the greater efficiency of boiler *A* as compared with No. 1 is not owing to difference in amount of heating surface, but to greater length of travel of the gases in contact with the same amount of surface, or, in other words, greater length of time for the transfer of heat. This is still better illustrated by boilers Nos. 2 and 3.

The efficiency of the *A* type as compared with that of Nos. 1 and 2 is based on this particular type, which is a high "double deck" apparatus, and it does not follow that a lower type would show such superiority. This may be illustrated by assuming that boilers *A* and No. 1 be each reduced one-half in hight, when the effect would be that the length of the travel of the gases with *A* would be reduced 50 per cent., while with No. 1 the reduction would amount to less than 10 per cent.; so, as the hight is less, the efficiency of *A* drops off very much faster, and while the gain in the high No. 2 over the low No. 1 type is small, with that of *A* it is very large.

The initial temperature, or, in other words, the condition of combustion, has more effect on the efficiency of the steam generating apparatus than has the cooling effect of the boiler. This is shown by the efficiency curves, Fig. 1, and if choice lay between the two, that of high initial temperature would be chosen; but high initial temperature is always dependent in skillful manipulation of the fire, and its attainment is difficult and more or less uncertain, while the superior boiler efficiency has a fixed value not dependent on the skill of the operator, and this value increases as the initial temperature decreases. There might be some question as to whether the full value of a good furnace would always be realized, but there could be no failure to realize the value of an efficient boiler.

The most remarkable feature of this matter of boiler efficiency is that the simple addition of inexpensive baffles, with no labor cost for operation and requiring no additional room in the plant, gives results equal to an economizer requiring a large investment, considerable expense for maintenance, and a large amount of space for its installation.

Furnace Performance.

The foregoing refers to the boilers only, and it is now in order to examine the furnace performance. The comparative test between *A* and No. 1 gave the following relation between the two apparatus:

	A	No. 1.
1. Efficiency of combined boiler and furnace	57.83	59.12
2. Efficiency of boiler	77.69	70.12
3. Superior efficiency of boiler	7.57	....
4. Superior efficiency of furnace	...	8.86

Item 1 includes all losses except that of combustible in the refuse, all other losses except hot gases and combustion being the same for each apparatus.

Item 2 is the measure of the cooling effect produced by each boiler.

Item 3 is the difference in the cooling effect produced by the two boilers.

The superiority of the furnace under boiler No. 1, Item 4, is owing to better combustion, there being a loss of 8.86 per cent. with the furnace of the *A* boiler, due to escaping hydrocarbons and incomplete combustion, the air supply being considered the same in each case. The reason for the difference in combustion with these two furnaces will be understood when each is examined in detail. The furnace under the numbered boilers will hereafter be referred to as the tile roof furnace, and the other as the *A* furnace; the former is shown in elevation by Fig. 4; the roof is made with tiles, shown by Figs. 5 and 6. The distance from the coal gate at the front of the furnace to the end of this tile roof is 16 feet, a distance through which the gases must travel before coming in contact with the boiler surface except in the lower half of the bottom row of tubes, which for a distance of about 4 feet back of the bridge wall are exposed as shown by Fig. 4, there being a distance of travel of 12 feet with no cooling effect, except that of radiation from the exterior furnace walls and through the tile roof. During the interval of time that the gases are moving through this distance of 16 feet their mixture is proceeding, so that before they have reached a point among the tubes where the temperature has dropped to a point below which union will be effected the mixture is completed; or, as more generally understood, complete combustion is effected.

With the *A* furnace the gases from the fire rise immediately and pass among the tubes of the boiler. There being not to exceed 3 feet in distance for the gases to travel before the tubes of the boiler are reached, the temperature soon drops to a point at which chemical union does not take place; the result is an escape of unoxidized combustible in the form of hydrocarbons, carbon monoxide and free carbon.

[A photograph of four stacks serving 24 boilers of types 1 to 3, fitted with the tile roof furnace, and fitted with chain grate stokers of the *A* type, showed no escaping smoke whatever. Another stack serving four type *A* boilers and equipped with chain grate stokers showed considerable smoke. In both cases the coal contained 59.7 combustible matter and 40.3 volatile matter. It is considered the poorest coal mined in Illinois on a large scale.]

Action of Tile Roof Furnace.

The theory of the action of the tile roof furnace may be given as follows: The coal entering at the front of the furnace has its volatile matter rapidly distilled in the form of a hydrocarbon gas in excess of the air supply at the front of the fire, and flowing back meets a larger air supply from the back of the fire, where the fuel bed is thinner. With this it mixes, the excess of air from the back satisfying the deficiency at the front; and being thoroughly mixed in the chamber below the tile roof, it becomes, strictly speaking, a product of combustion at high temperature, which carries its heat from the furnace to the boiler. Assuming that the action of this furnace is as described, it would appear possible to obtain complete combustion with no air in excess. The indications are that this is possible. With one of these furnaces carefully worked, and with the draft pressure at a certain determined intensity, it was possible to maintain an average as high as 17 per cent. CO_2, and for a few short intervals obtain as high as 19, according to the econometer connected to the furnace. There was no opportunity to test this condition with analysis, however, owing to the short duration of the intervals, but the econometer checked very closely with analysis at lower ranges. With the extremely small air supplies as given here, if the feed of coal was increased it was accompanied by a rise in CO_2 to the apparent theoretical maximum, after which it fell, owing, presumably, to carbon being oxidized to carbon monoxide, but there appeared to be no tendency for carbon to be set free.

With the *A* type chain grate stoker and boiler, or similar boilers and furnaces, the gas distilled at the front of the fire flows directly among the tubes and results in loss by unburned hydrocarbons and free carbon, the latter making smoke, while the large excess of air from the thinner back end of the fire also flows directly among the tubes, but at a different point, and there is but poor mixture. With such furnace the smoke and loss of hy-

drocarbons will drop off with increased excess of air, owing to a stronger draft, but the loss from this increased excess of air is greater than the combustion gain; therefore best efficiencies are to be obtained with the smoky condition.

Chain Grate Stoker.

The above, concerning the three types of boilers and two kinds of furnaces under discussion, may be followed by an examination, as far as present knowledge will allow, of the single type of stoker that is to be considered. This is the chain grate, and the one that is the nearest approach to an automatic machine; but in practice it is decidedly unsatisfactory so far as efficiency is concerned. The best performance secured with these stokers in the tile roof furnace boilers is as follows:

	Example 1.	Example 2.
Efficiency	72.0	69.8
Pounds of water evaporated per hour per square foot of heating surface	4.1	6.07
Horse-power per square foot of grate	6.13	11.6

From these examples the efficiency has ranged down to 40 per cent. and capacity in proportion. The size of the coal used has an important effect on capacity—all other conditions being the same—and may affect the result as much as 60 to 80 per cent. The greatest fault thus far recognized in chain grate stokers is the air leakage into the furnace at the back end of the grate. This and loss of combustible in the refuse are its major faults. With the grate as usually made and installed, an effort to prevent fuel being discharged over the back end by running short fires is accompanied by an increase of the excess of air that often overbalances the fuel saving.

The entrance of air at the back end of the grate is, strictly speaking, a leakage; its entrance is by way of openings at the side of the stoker, between the top and bottom chain and under the traveling grate, and into the furnace by way of the opening between the bridge wall and the end of the grate. For this leakage at the back of the fire there are two remedies; one is to make the opening for the discharge of the refuse only large enough to allow the ash to pass out and keep the end of the fire in contact with the bridge wall. This opening may be restricted by building the brick bridge wall the required distance above the grate, or by building into the point of the wall a metal box or pipe through which water circulates for the purpose of keeping it cool. The disadvantages of the brick wall are that the clinker readily adheres and makes trouble, and that the life of the brick at the lower edge is very short, requiring frequent and expensive renewal. The size of the opening is a matter that is necessarily unsatisfactory, because the amount of ash in the coal will differ and the opening must be large enough to accommodate the largest amount, consequently being too large when ash is low. The performance designated as example No. 1 was obtained with the brick wall described, and owing to an extremely large amount of ash in the coal the effect was to close the opening at the end of the grate largely with ash rather than with fuel, resulting in a comparatively small loss to the ash pit. Of these two means for keeping the air from leaking into the furnace by maintaining a joint between the end of the fire and the bridge wall, the water back is the most satisfactory.

The other method of stopping air leakage at the end of the fire consists in closing the openings at the sides of the stoker frames, between the bottom chain and the floor under the stoker, and between the upper and lower chains. With this scheme the air leakage is avoided without keeping the fire against the bridge wall. It was with this method that the performance designated as example No. 2 was obtained; the large capacity was owing to the use of washed coal from the Wilmington district of Illinois. At the present time the best means to offer for the remedy of the faults at the back end of the fire is to seal off the leaks as mentioned in the second method, and the use of the water back located as close to the grate as practicable. The latter performs an important office, inasmuch as it is an insurance against carelessness in running the fires over the back end of the grate.

With chain grates as generally installed and operated, all other conditions being the same, a reduction in the draft over the fire results in increased efficiency and reduced capacity. On the other hand an increase in draft over the fire increases the capacity but reduces the efficiency. In the plant mentioned as having the tile roof furnaces drafts over the fire range from 0.15 to 0.45 in inches of water, but the attainable depth of fire, height of coal in the hopper and speed at which the grate travels are the same for each strength of draft. It is entirely reasonable to assume that if 0.15 is strong enough 0.45 is too strong; likewise that if 0.45 is right 0.15 is too low, and it is apparent that the dimensions of the stokers and the various drafts are not in proportion to each other. In this plant the high efficiencies are always obtainable with the lowest drafts and the highest capacities with the strongest drafts.

It is the general tendency to seek a strong draft over the fire with chain grate stokers, and for this purpose induced mechanical draft apparatus and tall chimneys are employed; but suction drafts may be so strong as to cause such an excess of air to flow through the coal in the hopper as to prevent the fuel from igniting. It is possible that a moderate suction above and a pressure above atmosphere under the fire will give the most satisfactory results when large capacities are required.

Loss of combustible in the refuse with chain grate stokers has been observed as low as 1 per cent. With the tile roof furnace complete combustion with little or no excess of air has been secured, and if such desirable furnace conditions are combined with the performance of boiler No. 3 it will make an important improvement over the best prevailing practice. It is probable that this is the most efficient boiler of which there is any record. About the highest efficiency reported is that of a Thornycroft boiler by Professor Kennedy, showing 86.8 per cent. of the heat absorbed when evaporating 1.24 pounds of water per square foot of heating surface per hour with a condition of combustion about the same as that with No. 3; under these conditions the gases left at 41 degrees F. above steam temperature. With, however, an evaporation of 3.2 pounds of water per square foot of heating surface and a somewhat better combustion, the gases left at 165 degrees F. above steam temperature. In the case of boiler No. 3 the gases left at 92 degrees above steam temperature when evaporating 4.17 pounds of water per square foot of heating surface. No. 3 is a more efficient boiler than *A*, but owing to its design there is no favorable location for a superheater. With the *A* type the design affords an excellent location, which is sufficiently removed from the excessive furnace temperature, and at a point where it is high enough to insure the desired effect.

There is one feature of the tile roof furnace previously mentioned which is of considerable importance. It is the protection afforded to the lower row of tubes of the boilers designated as Nos. 1 to 3. It has been the maker's practice to use the tiles shown by Fig. 6. This leaves one-half of the bottom row of tubes exposed to the full furnace action; it does not matter that there are many hundreds of feet of surface in the boiler above, because the gases do not come in contact with this surface until after leaving the furnace. As with an economizer, the boiler is heated first. Applying this illustration to the surface exposed to the fire, the 110 square feet over the furnace may be assumed to be the boiler surface. This would mean that there are about 1.5 square feet of heating surface per square foot of grate; the result is that the tubes in the bottom row become blistered, bent out of line and fail, owing probably to the area of the tube not affording sufficient water supply. But with the tiles in place the tubes in the lower row remain as straight and in as good condition as those in the uppermost row.

Principal Losses.

In concluding this paper it will be interesting to make a comparison of the principal losses that occur with boilers and furnaces. For this purpose Figs. 12 and 13 have been prepared. These diagrams are designed to be pictorial illustrations showing the relations that these individual losses bear to each other, and would be best shown by one diagram if it were not for the complication of a large number of lines in one figure. For this reason the boiler loss is shown in Fig. 12 and that of the furnace in Fig. 13; with the former the performance of boiler No. 3 is selected to represent the loss owing to decreasing cool-

ing effect with a very efficient boiler, and No. 2 for a much less efficient boiler. The zero of loss is taken at the steam temperature, because below this point no further cooling of the gases can take place; the range of capacity is carried up to the evaporation of 12 pounds of water per square foot of heating surface per hour, and the location of the lines is governed by the performance of the

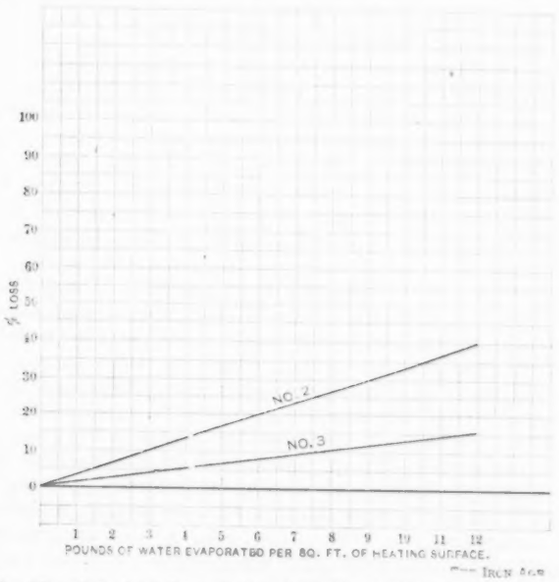


Fig. 12.—*Principal Loss Owing to Boilers' Different Capacities. —Air in Excess 85 Per Cent.*

two boilers in the tests before mentioned. These two losses are represented as straight lines, which is not entirely correct, because as such they will intersect the line of 100 per cent. loss if capacity be carried far enough, but a boiler could never be driven so hard that its efficiency would become zero. The representation by straight lines is sufficiently correct, however, for the purpose in hand.

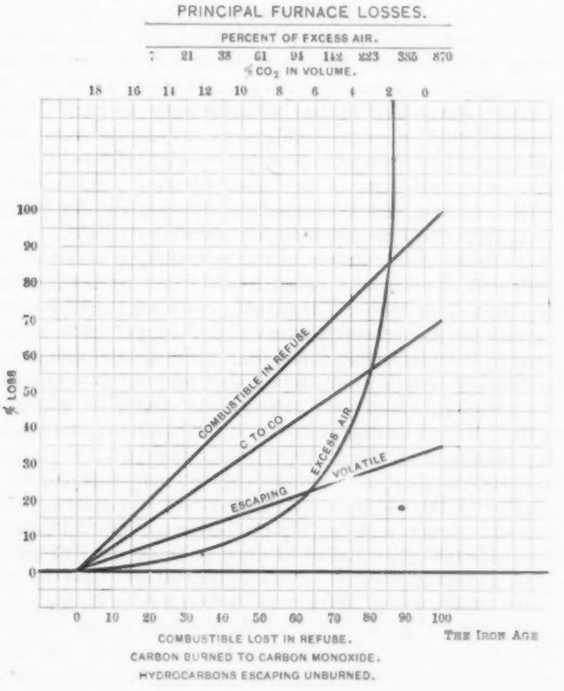


Fig. 13.

Referring to Fig. 13, the losses owing to combustible in the refuse, carbon burned to carbon monoxide, and to escaping volatile combustible, are each carried to the theoretical maximum. It is, of course, impossible that all of the volatile matter could escape unburned; or that all of the carbon could be oxidized to carbon monoxide, as this is unattainable even in a gas producer. Neither would it be possible for all of the combustible to be lost in the ash pit, because then there could be no fire. But it is useful to represent these three losses through this entire range for purpose of comparison with that owing to excess of air. The calculation of the loss of escaping volatile matter is based on Pittsburgh coal. The curve of excess of air is based on a final temperature of 550 degrees F. and a combustible of 14,000 British thermal units per pound. As mentioned, the combustible losses can never be as high as 100 per cent., but the loss by excess of air can be as high as that, because, with a small fire and large enough air supply, the initial temperature may be as low as that of the boiler. For this loss to be over 100 per cent., however, requires that stored heat from brick work and furnace walls be given up to the air and gases in the furnace in addition to the heat from the fuel; such loss can exist for only a short time, because the brick work would soon become cooled. But that it is possible is proven by measurements showing a final temperature of 520 degrees with 1 per cent. of CO_2.

English Open Hearth Charging Machine.

In a recent issue the *Iron and Coal Trades Review* of London describes a furnace charging machine which has been designed and patented by A. Patterson of 9 Glossop Terrace, Cardiff. The charging machine is carried on an overhead traveling crane running in a line with the furnace, and on which the charger, traveler girders and wheels travel. On the top of the traveler girders are rails to carry the cross traversing carriage from which depends the charging machine, which is suspended by a center trunnion carried on roller or ball bearings with a bottom ring of roller or ball thrust bearings. On the trunnion is fixed a worm wheel; it is geared to a motor to rotate the machine as required. On this carriage there is also a motor and gearing to work the cross traverse. On brackets on the side of the traveler girders is carried a motor for driving the traveler, which is driven from the center of the girders, so that the torsion on the shafts shall be equal. The trunnion is hollow so that all the electrical wires and connections conveniently pass through the center. From the lower portion of the charger depends a platform carried on trunnions. This platform, by means of a lever worked by a motor and gearing with ball thrust bearings, can be rotated on the trunnion, lifting or lowering the charging box, as required.

On the platform are two motors, one for working a rack with a pusher plate to discharge the contents of the box when in its right position, and the other being used for engaging the end of the charging box with the gripper arms by means of toggle gear, with ball thrust bearings and screw and nuts.

The method of working this machine is as follows: The charging boxes are brought by cars on a railway close to the front of the furnace to be charged, each car carrying about four boxes filled with material to be charged in the furnace. The charging machine is brought into position, which need not be very accurate, as the gripper arms will adjust the position of the box. When the gripper has engaged the end of the box and lifted it off the top of the car clear of the dead plate of the furnace, the charger is propelled forward into the furnace to the position required to discharge it. The motor working the pusher plate by means of a rack and gearing is put into operation and the box is discharged, and, at the same time, the charger travels back out of the furnace. When the contents of the box have been discharged the pusher plate is withdrawn, and when it has reached the closed end of the box it is automatically disengaged by means of a locking bolt working in inclined grooves. The attendant with the controlling gear is at the back of the machine.

The advantages claimed by this machine are as follows: The charger not being carried on the charging floor, the floor can be used for furnace tools and other materials. It is not necessary to remove the handles for controlling the furnace and gearing. The machine can be maneuvered to clear any obstacle and charge the furnace at any angle. The charge being pushed out at the further end of the box, the box does not become jammed with the material discharged, and the operator is able to place the material well away from the door of the furnace.

Nickel Steel: Its Properties and Applications.*

BY ALBERT LADD COLBY, SOUTH BETHLEHEM, PA.

In 1899, in discussing the well-known paper of James Riley, the father of nickel steel, Mr. Snelus remarked that Shakespeare told them that they might find "tongues in trees, sermons in stones, books in running brooks, and good in everything," and those who had studied meteorites appeared to have overlooked the fact that the metallic meteorites consist largely of alloys of iron and nickel, the practical applications of which they were now for the first time becoming acquainted with, in alloys of iron and nickel produced by themselves. "He was ashamed that he himself had so long overlooked Nature's teachings."

While my search through the "Proceedings" of scientific societies for the past 80 years shows that Mr. Snelus was a little severe in his criticism of his fellow ironmasters, inasmuch as the advantages of alloying nickel with iron and steel have been known and acknowledged by many investigators over a long period of years, it is nevertheless true that Mr. Riey was the first to publish a series of practical experiments proving the valuable properties possessed by nickel steel and pointing out many of its important applications.

In 1822 Stodart and Faraday published their experiments made at Sheffield in the alloying of nickel and iron. A little later Berthier made some similar experiments in France.

In 1830 Wolf of Schweinfurt, Germany, put some nickel-iron alloys on the market, which he called "meteoric steels." They were damasked, and Liebig comments on their magnificent appearance in a note in the *Annalen der Pharmacie* and states that this alloy is destined to be developed in the near future.

In 1853 Fairbairn published some experiments undertaken to determine the strength of some alloys of nickel and iron, similar in composition to meteoric iron.

At the exposition held in New York in 1853 Philip Thurber exhibited several samples of nickel steels produced from a nickeliferous limonite.

In 1858 Sir Henry Bessemer made an experimental 3 per cent. nickel-iron alloy, with a view of making what he termed "meteoric iron guns." He did not, however, pursue the subject, nor publicly refer to the matter until 1896.

Percy, in his "Metallurgy," published in 1864, refers to experiments conducted by Richardson in his (Percy's) laboratory on nickel-iron alloys varying from 1 to 50 per cent. nickel.

In 1870 Alex. Parkes of Birmingham took out several patents for the production of alloys of iron and steel.

In 1883 John Gamgee made nickel-iron alloys in Connecticut.

In 1884 A. M. Clark of London patented the manufacture of a malleable ferro-nickel.

In 1885 ferro-nickel was manufactured at Marbeau's works, at Montataire, France, under the supervision of Bertheault.

In 1887 highly carboniferous nickel steels were made experimentally at the steel works at Imphy, France.

In 1888 and 1889 several French and English patents for the manufacture of nickel steel and its applications were granted to Marbeau, Schneider, Riley and Hall.

It is therefore evident that the advantages of alloying nickel with iron and steel have been known for some time. The credit of making the first systematic series of practical tests on nickel steels belongs, however, to James Riley, then of Glasgow, whose elaborate paper on "The Alloys of Nickel and Iron" was read by him before the Iron and Steel Institute of Great Britain on May 8, 1889. From a discussion of this paper it appears that J. W. Hall of Sheffield had been working on similar lines to Mr. Riley, but his results had not been publicly put on record. Mr. Riley's paper gave the impetus to the introduction of nickel steel in a commercial way.

* A paper read before the American Society for Testing Materials.

Since Riley's practical and suggestive paper the technical men of many steel works in France, Germany, Great Britain and America have made nickel steel, studied its physical properties and have put it on trial for a wide variety of purposes. In this work they have ben aided by consumers looking for a better material, by scientists connected with the technical universities in each country, as well as other independent investigators.

Manufacture of Nickel Steel.

No detailed reference to the melting of nickel steel and its subsequent rolling, forging and machining is possible within the scope of this paper. As is well known, nickel steel is melted in both the acid and basic open hearth furnace, in the Bessemer converter and in the crucible. From personal observation, the writer has found that the valuable properties of this special steel have been recognized and applied by the principal steel makers of Great Britain and the Continent, as well as by several of the steel melters of America. The physical constants of the metals, nickel and iron, are so closely allied, a fact proven by their occurrence in metallic meteorites, that no special precautions other than those incident to good melting practice are necessary during any of the above standard processes of steel melting in order to insure a thorough mixture of the nickel and iron in the manufacture of nickel steel of any desired percentage of carbon, and with or without the presence of special elements, such as chromium, manganese, tungsten, molybdenum, &c. This fact is of great practical importance, especially in such applications as armor plate, marine and stationary shafting and engine forgings, rails and bridge material, which necessarily involve the casting of large masses of this special steel. Precautions must be taken in the rolling or forging of nickel steels, and especially in their final heat treatment. The steels below 15 per cent. nickel are also more difficult to machine than simple steels of the same carbon content. These difficulties have, however formed no serious barrier to its successful introduction for a wide variety of purposes.

Physical Properties of Nickel Steel as Compared with Carbon Steel.

When the physical properties of nickel steel, as compared with those of carbon steel, are better known and more fully appreciated, the amount now used for the purposes for which it has already been successfully introduced will be considerably augmented and new applications will undoubtedly result. It is appropriate, therefore, to review some of the more striking physical properties, obtained as suggested by Snelus, by "following Nature's teachings and alloying nickel with iron."

Modulus of Elasticity.—The modulus of elasticity or coefficient of elasticity of such materials as steel, which have a well defined elastic limit, is determined by dividing the tensile stress in pounds per square inch at any point in the test below the elastic limit by the elongation per inch of length produced by said stress. The modulus of elasticity, which may therefore properly be regarded as the measure of the stiffness of the material, is remarkably constant in steel, notwithstanding great variations in chemical analysis, temper, &c. Young's modulus is practically the same for both tool steel containing 1.40 per cent. carbon and for the mildest steel used in boilers. The modulus of elasticity of steel is in fact rarely found to be below 29,000,000 or above 31,000,000, and is generally taken at 29,500,000 or 30,000,000 in engineering calculations. A prejudice exists against nickel steel in the minds of some engineers owing to items which have appeared in the technical journals that the modulus of elasticity is lower in nickel steel than in carbon steel. The fact is, however, that while the high nickel steels, especially those containing 20 per cent. nickel or over, do have a lower modulus of elasticity than carbon steel, nickel steels containing, say, 4 per cent. of nickel or less, such as are applicable for shafting, forgings, bridge construction, rails, &c., have the same modulus of elasticity as carbon steels—viz., in the neighborhood of 29,000,000 pounds per square inch. In proof of this assertion the writer could quote the result of many calculations of the modulus of elasticity of various steels containing below 5 per cent. nickel, made from the detailed

records of the physical tests published annually by the United States Army Testing Laboratory at Watertown, Mass., under the charge of J. E. Howard, the accuracy of whose work is beyond question. Evidence could also be cited from the experiments of foreign scientists, such as Mercadier, Wedding, Rudeloff and Guillaume, all of whom support the above assertion that the presence of 4 or 5 per ceit. of nickel in steel has no appreciable effect in reducing its modulus of elasticity.

Tensile Strength and Elastic Limit.—If space would permit, a large amount of evidence could be cited to prove that nickel steel is chiefly distinguished from simple carbon steel by its proportionately high elastic limit. Furthermore, if 3 per cent. nickel is alloyed with an open hearth steel of 0.25 per cent. carbon, it produces a metal equal in tensile strength to a simple carbon steel of 0.45 per cent. carbon, but having the advantageous ductility of the lower carbon steel. On low carbon steels not annealed in addition of each 1 per cent. of nickel up to 5 per cent. causes, approximately, an increase of 5000 pounds per square inch in the elastic limit and 4000 pounds in the ultimate or tensile strength. The influence of nickel on the elastic limit and ultimate strength increases with the percentage of carbon present, high carbon nickel steels showing a greater gain than low carbon nickel steels. In short, the addition of nickel to steel raises the proportion of elastic limit to ultimate strength and adds to the ductility of the steel. This effect of nickel in increasing the ratio of the elastic limit to tensile strength, without sacrifice in ductility, accounts for the increase in the working efficiency of nickel steel over carbon steel—in other words, its increased resistance to molecular fatigue.

Elongation and Contraction of Area.—The comparison of the results obtained from a large number of tests cut from full sized prolongations of forgings of both carbon steel and nickel steel show that for a given tensile strength the presence of 3 to 4 per cent. of nickel increases the elongation, and to a greater extent the contraction of area. On the other hand, comparing simple carbon steel and 3 to 4 per cent. nickel steel of the same carbon content, the nickel steels will be found to have from 35 to 40 per cent. greater tensile strength with practically the same elongation and contraction of area as the simple carbon steel. This increased ratio in the nickel steel of ductility to elastic limit and tensile strength is another index of its increased value over carbon steel for purposes where in service the material must resist severe and sudden shocks or rapidly repeated alternating stresses.

Effect of Compression.—The exhaustive series of experiments made by Wedding and Rudeloff show that the resistance to compression of nickel-iron alloys increases steadily with the per cent. of nickel present until 16 per cent. of nickel is reached. Hadfield has also made a very complete series of experiments on the resistance of nickel steel to compression. He has found that a steel containing 0.27 per cent. nickel shortened, under a compression of 100 tons (224,000 pounds) per square inch, 49.30 per cent. in length of 1 inch; a steel with 3.82 per cent. nickel shortened 41.38 per cent.; with 5.81 per cent. nickel 37.76 per cent., and with 11.30 per cent. nickel only 1.05 per cent. He states that an ordinary mild carbon steel without nickel, under similar conditions would be shortened 60 to 65 per cent. He also states that the increased resistance to compression of nickel steel is not due to its hardness, an important point in the practicable application of nickel steels where machining is necessary. He argues that the toughening action of nickel when added to steel is caused by a very intimate combination of the molecular structure, and that this advantage is further enhanced by the fact that the nickel does not show a disposition to segregate in steel like other elements; in other words, it appears to be more intimately combined. A striking illustration of the ability of nickel steel to resist compression was exhibited to the writer in 1900 by Holtzer & Co. A cylinder 7.87 inches in hight, 6.97 inches external diameter and walls of 0.73 inch in thickness, cut from a nickel steel gun hoop, was compressed by a load of 886 gross tons down to a hight of 4.72 inches. The internal fibers were thereby extended 46 per cent. and without the formation of any cracks.

Rigidity.—The superior stiffness of nickel steel over carbon steel without any sacrifice in its toughness has been proved in numerous applications coming under the writer's observation; this combination of properties forms one of the strongest arguments in favor of the use of nickel steel for a wide variety of applications where the service demands a rigid as well as a strong, elastic and tough material. H. A. Wiggin states that, in his experience he found that nickel steel under the drop test gives better results than carbon steel, even in a greater ratio of superiority than exists in the comparison of the tensile tests of the two steels. J. G. Eaton made a comparative test of nickel steel plate and carbon steel plate with a view of subjecting both plates to the same strains as those experienced by bottom plating. Both plates were riveted to angles in a manner intended to imitate the riveting of a ship's plate between the frames. A round faced punch placed on each plate was then struck by a heavy falling weight. Each plate endured 13 blows before rupture, and at the next blow each plate showed a clear aperture; that in the carbon steel plate, however, was 23 1-10 square inches in the clear, while the aperture in the nickel steel plate was ¼ square inch; a ratio, therefore, of 30.5 to 1 in favor of nickel steel. D. H. Browne states that a 3 per cent. nickel steel shows about 48 per cent. greater stiffness and 45 per cent. greater toughness than carbon steel; the word "stiffness" referring to the amount of deflection produced by the blow, while the word "toughness" refers to the number of blows required to produce the rupture.

Cold and Quench Bending Test.—Nickel steel will resist bending both before and after quenching better than carbon steel of similar tensile strength. This has been strikingly illustrated in a long series of practical tests made on nickel steel plates by Mr. Beardmore at his Parkhead Steel Works, at Glasgow, Scotland. These tests included quench bends, cold bends and also cold bending tests of the nickel steel plates with holes drilled in the tests prior to the bending. The results of Hadfield's careful experiments on the bending properties of cast and forged nickel iron alloys, varying from 0.27 to 49.65 per cent. of nickel, may be summarized in his statement "that from about 2.50 to about 6 per cent. nickel the bars certainly showed greater bending angles than those of any other iron alloys experimented on" by him.

In a series of comparative tests of carbon steel and nickel steel, such as is used for forgings, made at the works of the Bethlehem Steel Company, the writer obtained bending tests on the unannealed, annealed and oil tempered nickel and carbon steels which show the superiority and freedom from brittleness of the nickel steel. A comparison of the physical properties of the two steels is as follows:

Heat treatment given to each steel.		Tensile strength. Pounds per square inch.	Elastic limit. Pounds per square inch.	Elongation in 2 inches. Per c't.	Contraction of area. Per c't.
Annealed	Carbon steel	109,500	51,440	19.50	30.31
	Nickel steel	100,330	66,720	25.00	54.50
Oil tempered	Carbon steel	129,360	67,230	17.50	38.53
	Nickel steel	103,890	76,390	25.00	61.56

Hardness of Nickel Steel.—It has been definitely proved that a very low carbon steel cannot be made hard by the mere addition of nickel. Nickel steel is tougher than carbon steel, but is not harder in the true meaning of this latter term. The hardness of nickel steels, below about 15 per cent. of nickel, depends upon the proportion of nickel and carbon jointly. Thus while a steel with 2 per cent. nickel and 0.90 per cent. carbon cannot be machined, a steel with 3 per cent. nickel and 0.60 per cent. carbon can be machined. The freedom from hardness of comparatively low carbon nickel steel is strikingly illustrated by the writer's experience in cutting with a penknife the rifle barrels made at Bethlehem of steel containing 4.50 per cent. nickel and 0.30 per cent. carbon, and yet this steel had an elastic limit of over 80,000 pounds and a tensile strength of over 100,000 pounds per square inch. At 20 per cent. of nickel, as stated by Riley, successive increments of nickel tend to make the steel softer and more ductile, and even to neutralize the influence of carbon.

Resistance to Torsion.—Nickel steel resists torsion or

twisting stress better than the same class of carbon steels. Riley's experiments indicate that it is not necessary to use steels high in nickel to obtain the best effect in torsional resistance. The writer has found that several of the French steel works have appreciated this property of nickel steel by applying it for the manufacture of special wire and springs.

Resistance to Wear or Abrasion.—The rigidity and toughness of nickel steel makes it a desirable metal where, in service, the material is subjected to wear or abrasion. Practical evidence of this statement is found the three years' comparative trial of nickel steel and in carbon steel rails on the "horseshoe" curve of the Pennsylvania Railroad, which has recently resulted in orders being placed for some 10,000 tons of nickel steel rails for the sections of the tracks of the Pennsylvania, Baltimore & Ohio and New York Central & H. R. R. where in the past frequent renewals of the carbon steel rails have shown their inability to withstand the severe abrasion due to the sharp curves and heavy traffic. Further evidence of the value of nickel steel to withstand abrasion is found in the results of experiments carried on by one of the French railroads in the trial of nickel steel for locomotive tires.

Expansion of Nickel Steel.—The coefficient of expansion of nickel steel varies greatly with the percentage of nickel present; especially in the series of nickel steels containing from 20 to 45 per cent. of nickel. The 36 per cent. nickel steel is called in France "Invar" (from the word "Invariable") has a lower coefficient of expansion than any other metal or alloy known. Guillaume, of the International Bureau of Weights and Measures, the best authority on this subject, and whose opinion is also supported by other experts, states, however, that there is no practical difference between the expansion of simple carbon steel and of steel containing up to 5 per cent. of nickel. In the use, therefore, of low carbon 3 to 5 per cent. nickel steels in bridge construction the same allowance for expansion can be made as when carbon steel is used. This is an important point, especially when both carbon steel and nickel steel are to be used in the same structure. The different coefficients of expansion of steels containing from 30 to 45 per cent. of nickel have resulted in their application in France and Germany for a wide variety of purposes, which will be referred to later.

Effect of Punching and Shearing on Nickel Steels.—Beardmore, the Scotch steel maker, after an elaborate series of tests, places the loss of strength due to punching ordinary mild steel at 33 per cent. of the original strength, and claims that the loss of strength in punching nickel steel varies from 15.5 to 20 per cent. of the original strength, and, furthermore, that on thicker sections of nickel steel plate the loss of strength is only about 10 per cent. A number of other experimenters have also found that nickel steel plates are not weakened by punching to as great an extent as carbon steel plates.

There is ample evidence that the presence of nickel in steel increases its shearing strength. This is important, especially in connection with riveted work, as the strain on the rivet is not a simple strain, but rather a shearing or cutting action. Moreover, in the shearing of nickel steel rivets the fracture is fibrous and the metal appears to have torn gradually, whereas in ordinary carbon steel rivets the metal breaks off short. From the results of a comparative test made at Bethlehem on nickel steel and carbon steel rivets the conclusion was drawn that "It may be safely deduced that a ¾-inch nickel steel rivet will replace a 1 1-16-inch, or even possibly a 1⅛-inch, common steel rivet, thus effecting a saving of considerable plate section and giving increased strength. Experiments made by Beardmore, Abraham and Rudeloff, and at the Creusot Steel Works, also testify to the increased shearing strength of nickel steel rivets. Experiments made by the Société Denain and d'Anzin prove that 5 per cent. nickel steel rivets possess over twice the shearing strength of iron rivets. Browne states that the sheared edges of carbon steel plates often cut ragged, whereas nickel steel cuts clean.

Segregation.—The writer's opinion, based upon a large number of chemical analyses made at Bethlehem, is that nickel in itself segregates but very slightly, even in large armor plate and shafting ingots. This is natural, as the atomic volume, atomic weight and specific gravity of nickel are similar to those of iron. Some experimenters testify that nickel tends to check the segregation in steel of the other elements, such as sulphur, phosphorus, carbon, manganese and silicon. Mr. Hadfield thinks that the tendency of nickel to check segregation is probably due to the fact that it raises the melting point of the carbides or cementing material and causes the whole mass to set more nearly together, and quotes in proof that nickel steel ingots have a finer grain than carbon steel ingots. Mr. Chase of the Midvale Steel Company states that "nickel is supposed to lessen the segregation and liquation of carbon by combining with the carbon which cements the particles of iron together, and thus bringing the specific gravity of the carbon compounds nearer to that of the rest of the alloys in the fluid mixture. It also seems to cause this cementing carbon to solidify at more nearly the same temperature as the other alloys." Mr. Campbell of the Pennsylvania Steel Company made a series of tests to prove what he states to be the current impression among manufacturers of nickel steel, that the presence of this element prevents segregation. His conclusion is that there seems to be good ground for the assumption that nickel prevents the separation of the metalloids, but that it does not prevent it altogether, and he states that it is not probable that any other agent will ever be found competent for this task.

Within the limits of this general review it is impossible to refer in detail to the interesting subjects of the heat treatment, the critical points, the molecular relation of nickel to iron and carbon, and the microstructure of nickel steels, the effect of extreme temperatures, and the electrical and magnetic properties, particularly of steels containing over 20 per cent. of nickel.

Sufficient evidence has, however, probably been presented to prove that nickel steel possesses many advantages of practical importance over simple carbon steels, and the engineer looking for a trustworthy material will be convinced by what has been presented that it is safe to give nickel steel a practical trial. In the preceding pages the writer has shown that alloys of nickel and iron have long been made, and that their principal physical and chemical properties have been carefully studied. He now proposes to briefly summarize the applications of nickel steel which have come under his personal observation, hoping thereby to convince the engineer who looks upon nickel steel as a new material that he is warranted in giving it a trial, owing to the success which has already attended its practical trial, at home and abroad, for a wide variety of purposes.

Applications of Nickel Steel

The advantageous physical properties of nickel steel over carbon steel just briefly reviewed cannot fail to suggest numerous applications where this special steel is of decided practical advantage and where the demands in service amply warrant its somewhat increased cost. That the properties of this material have been fully appreciated in some instances is proven by the large number of purposes to which it has been applied both in this country, in England and on the Continent. Within the limits of this paper the applications for nickel steel which the writer has found during the past year's special study of this subject can be but briefly summarized.

As is well known, the advantages of nickel steel for armor plate have been recognized for some years, so much so that nickel steel, with or without chromium, is now used entirely by the manufacturers of armor plate in all countries. It is used also for the manufacture of ammunition hoists, communication tubes and turrets on battleships, for gun shields and for armor plate bolts, and also for the large safe deposit vaults made of harveyized nickel steel armor plates.

Nickel steel is used for a wide variety of forgings and drop forgings, including the axles and certain other parts of automobiles, marine engine forgings, shafting and crank shafts for government and merchant marine, stationary engine forgings and shafting and locomotive forgings, the latter including axles, connecting rods, piston rods, crank pins, cross heads, links, link pins and

pedestal cap bolts. Also for forged piston rods for steam hammers and rock drills, sea water pumps, stationary engines, &c.

It has been applied to the manufacture of axles not only for automobiles and locomotives but for electric, passenger and freight cars, field gun carriages, &c.

The advantages of nickel steel castings are also being generally recognized. Test specimens cut from coupons from annealed nickel steel castings can be guaranteed to show an elastic limit of 50,000 pounds, as determined by an electric micrometer, with an elongation in 2 inches of at least 18 per cent. In some locomotives now building nickel steel castings have been used for all of the following parts: frames and rails, driving wheel centers, driving boxes, driving collars, drawhead pocket, rocker shaft, guide yoke knees, eccentric straps, equalizing beams, reverse shaft, cross ties, lifting links and cross heads.

Nickel steel castings have also been introduced for large hydraulic cylinders and for the crank webs of shafting, for propeller blades, rudders, large pinions, gearing and gear wheel blanks, and also for plate rolls.

Rolled nickel steel in the form of rounds, billets, flats, &c., has received a wide variety of applications, including bolts, locomotive stay bolts, pedestal cap bolts, rivets, bicycle chains, holding down bolts for gun mounts and other parts of ordnance.

The application of nickel steel for rails and splice bars has been referred to by the former speakers. It is about to be applied in this country for the manufacture of locomotive tires. It has been successfully tested abroad for this purpose, both in England and in France, and also for the manufacture of frogs and switches.

There is no doubt that in the near future nickel steel will enter into bridge construction and for certain structural purposes. Its properties are especially-attractive for long span bridges, and also in cases where the element of freight enters so largely into the cost of the structure as to make lightness in construction a desirable factor.

Besides armor plate, nickel steel has been used to a considerable extent for deck, hull and ship plate, and it has been widely used abroad, especially in France, for artillery plate, including the plates used in the construction of ammunition wagons, artillery boxes, cartridge boxes, &c. It is about to be tried for locomotive fire boxes and boiler plate, and these results will be watched with considerable interest. It has also been used abroad for air reservoirs for torpedo boats and for tanks for compressed oxygen, carbonic acid, hydrogen, &c.

Nickel steel enters into the construction of ordnance to a considerable extent, especially abroad, including gun forgings, rifle barrels and small arms, revolvers, gun shields, powder tubes, projectiles, shrapnel, shot, shells, &c.

In the form of wire nickel steel has received many applications, including resistance wire as a substitute for German silver, wire cables for wet mines, torpedo defense netting, electric lamp wire as a substitute for platinum wire, umbrella wire, corset wire, and also a large number of special applications where the desired property is a low coefficient of expansion, such as wire used in the manufacture of armored glass, in the mounting of lenses, mirrors, level tubes, &c., and for balances for clocks, measuring rods, measuring wire, rules, pendulum rods, thermostats, rheostats, weighing machines, circuit breakers, &c.

High carbon nickel steels have also been introduced to a considerable extent abroad for special springs, both in the form of wire and flats. Quite a number of tool steels on the market, especially the foreign steels, contain a certain proportion of nickel. Nickel steel is also used for dies, taps, set screws, cutlery, table ware and harness mountings.

Some of the lower nickel steels when drawn into tubes furnish a very stiff material with an elastic limit of about 100,000 pounds, applicable for all sorts of machine construction where strength and lightness must be combined. The field for this application of nickel steel is a wide one and after a few manufacturing difficulties have been overcome this class of tubing will be placed on the American market.

One of the most promising applications for high nickel steel is noncorrosive, seamless tubing for automobile boilers, locomotive boilers, stationary boilers, marine boilers and marine condensers, and for gas engine hot tubes. This tubing has recently been introduced on the American market by the Shelby Steel Tube Company. It is manufactured from a 30 per cent. nickel steel furnished them by the Bethlehem Steel Company. The increased initial cost of these high nickel steel tubes is fully offset by the following advantages:

1. Obtaining a practically noncorrosive tube, thus avoiding the expense of the frequent renewals due to the "pitting" of both iron and low carbon steel tubes.

2. Increasing strength over iron and steel tube, thus allowing, without risk, the use of a tube of lighter gauge, which insures a saving in the original weight and cost, as well as an increase in steaming efficiency.

3. These tubes, when they finally are taken out of the boiler, can be sold to steel companies making nickel steel at the market price of steel tube scrap, plus about 20 cents per pound for the contained nickel.

It will probably be a surprise to many to note from the above summary the wide variety of purposes for which nickel steel has been already successfully applied. The United States is perhaps in the lead in the applications which have been made of 3 to 4 per cent. nickel steels. France is undoubtedly in the lead in the applications of the higher nickel steels.

The wide range in physical properties of steels containing from 2 to 45 per cent. nickel, and the variations in each grade resulting from different carbon content, or the presence of some special element such as chromium, molybdenum, tungsten, &c., make the study of the alloys of nickel, iron and carbon imperative to the engineer in search of a safe material with an exceptionally advantageous combination of physical properties.

The St. Louis Model Foundry.

At their June meeting the Philadelphia Foundrymen's Association appointed a committee for the purpose of aiding the authorities of the Louisiana Purchase Exposition in presenting to the visitors a model foundry in actual operation. This committee, consisting of Elmer E. Brown, chairman; Thomas Devlin, Howard Evans, Alex. E. Outerbridge, Jr., and Geo. H. Davis, met at room 306, Bourse, on August 11, for organization. After considering the situation the chairman was instructed to communicate with Joseph A. Holmes, chief of the Department of Mines and Metallurgy, at whose suggestion the committee was appointed, in order to define their work and place it in such shape that a formal announcement can be made to the foundry and allied trades. It is hoped that the committee will be able to report progress in the announcement of the September meeting of the Philadelphia Foundrymen's Association.

The proposed model foundry would serve as an exhibit of all foundry equipment and material, such as cupolas, blowers, cranes, flasks, molding machines, sand mixers, rattlers, core ovens, sand blast, heating and ventilating apparatus, pneumatic chippers, rammers, lifters, &c. Ordinarily these articles would be scattered among the various exhibits, whereas under the proposed plan they would be seen in actual operation and would be interesting and instructive to all foundrymen.

Colonial Steel Company.—In the Pittsburgh papers recently appeared a statement that the entire plant of the Colonial Steel Company, at Colonia, Pa., had been closed down for an indefinite period, and that negotiations were under way looking to the sale of the plant to the Crucible Steel Company of America, but this is officially denied. The facts are that the melting department of the Colonial Steel Company is in full operation, and that the only shutdown at the works is in the puddling department, which is usual in the hot weather. That department was closed on July 4. The melting department has not been shut down, and there is no intention of closing it. We can state officially that no negotiations are on looking to the sale of the works of the Colonial Steel Company to any other interest.

Australia Exporting Harvesting Machinery.

MELBOURNE, AUSTRALIA, July 13, 1903.—The above is a rather curious heading to appear in *The Iron Age*. None the less, it is an accurate one. The value of the exports does not run to a very large figure so far. In the *Australasian* for July 11 appears a photographic reproduction of a train load of Union harvesters, manufactured by Nicholson & Morrow of Melbourne. The illustration represents one of a series of shipments from Melbourne to the Argentine. This harvester is an Australian invention, copied during recent years by other countries. It is a combination of the stripper and winnower, and is especially useful where the straw is of low value. The two principal makers in Australia are H. V. McKay of Ballarat, Victoria, who makes the Sunshine harvester, and Nicholson & Morrow of Carlton, Melbourne, who manufacture the Union. In Argentina the Union has been specially approved for excellent work in prairie grass and linseed. A shipment of harvesters went by the mail boat "Sierra" some weeks ago to California, and Australians naturally feel some small pride in sending this class of machinery to compete in the American home market.

The shipments from Melbourne to Argentina will be saddled with two freights, one from Melbourne to London by Orient mail boat, and another from London to the Argentine, to say nothing of the rehandling charges in London. Winning trade so far away from home and under the noses of the huge American and English makers is something for Australian makers to be proud of. The American makers will no doubt take the lesson to heart.

Mephan Ferguson, the Melbourne engineer, whose patent spiral riveted pipe is known the world over, is about to erect works for the manufacture of these pipes, in connection with an English contract, at Tipton, Staffordshire, using Staffordshire and West Coast steel. This is another triumph for Australian energy and ingenuity, for, though Mr. Ferguson is a Scotchman by birth, he has been in Australia so long as to be Australian at heart, and by sheer ability and industry has built up large works at Melbourne, Adelaide and Perth for the manufacture of all kinds of heavy iron work and machinery, as well as his riveted pipes.

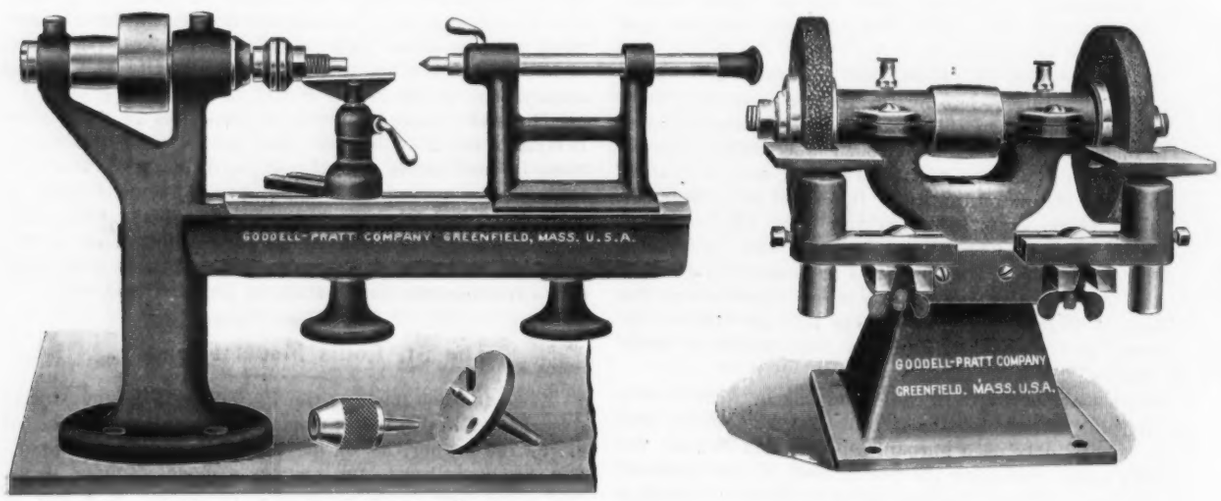
A bill to provide for conciliation and arbitration for the prevention and settlement of interstate industrial disputes has been introduced in the Federal House. Pending its becoming law, it would be waste of time and space to discuss in detail the machinery provided. The labor party are naturally delighted, since the bill will strengthen their position. Employers view it with alarm, and the various employers' federations in the States are about to take action to provide a fund to strengthen their position at the next general election. In New Zealand the working of a similar act does not appear to have given satisfaction to employer or employee. If the Federal bill is passed details will be duly forwarded But it is doubtful if it will become law, the machinery provided being of too expensive a character.

Goodell-Pratt Polishing Lathe and Grinding Head.

The Goodell-Pratt Company of Greenfield, Mass., are bringing out a small polishing lathe, having a bed 12 inches long and a swing of 5 inches. It is provided with a two-step cone, and furnished with a saw arbor, three-jaw chuck and face plate. It also has a T-rest attachment and sliding tail stock. The tool is intended to meet the demand for a small polishing lathe, a little more complete than an ordinary polishing head.

Grinding Head.

The grinding head shown in the second engraving is 7 inches high. The spindle is 9 inches long, ¾ inch in diameter in the bearings and ½ inch between the flanges holding the wheels. It will take wheels ¾ inch thick 8 inches in diameter. The base it so shaped as to insure great rigidity.



THE GOODELL-PRATT POLISHING LATHE AND GRINDING HEAD.

A Berlin cablegram states that the official report of Commercial Councillor Bocker, who made a recent tour of America, has been published. He expresses the belief that the enormous progress of the United States during the past decade will continue at an increasing ratio, and that America will still find the largest market for her industrial production within her own borders. He admits that protective duties have enabled the United States to compete successfully in foreign markets, but he does not consider this as ground for reprisal, as the world is wide enough for both the United States and Germany. The lessons that Germany has to learn from America, the report says, are the specialization of industry, the reduction of cost through the use of labor saving machinery and the distribution of work among affiliated companies. He foresees danger to Germany from the operations of the United States Steel Corporation, mainly in respect to manufactured goods.

Advices from Australia state that the means of subsistence of 40,000 persons is seriously threatened by the closing of the large Broken Hill silver lead mines. The failure of the water supply is the cause of the suspension. The district is in a remote desert and outside the artesian area. Arrangements have been made with the South Australian Government to supply water for use in the houses, but this does not permit the mines being worked. The water obtained from South Australia is brought in by train and costs $10 per 1000 gallons.

The Cheapening of Coal.

BY F. E. SAWARD.

Anthracite Steam Coal.

One of the peculiar features of the coal industry this year is that there is a very large production of anthracite. While this description of coal is composed in the main of sizes used for domestic fuel, yet in the preparation thereof there is an important proportion of the minor sizes made which enter into use for steam raising in all the varied industries, particularly in the Middle and Eastern States. It is, therefore, of great interest in this regard to note the proportions of the various sizes of anthracite coal. The best information on this point is found in the last annual report of the Girard Estate, which gives the proportion as follows: Chestnut and larger, 49.76 per cent.; pea, 15.47 per cent.; buckwheat, 23.49 per cent.; rice, barley, &c., 11.28 per cent. Some mines may do a little better on the domestic sizes, but this proportion, with a large output, means a lot of steam coal, much to the advantage of the consumer. The fact that the production of the junior sizes has now reached a monthly total of about 2,000,000 tons seems to be generally disregarded. This tonnage has to be disposed of, and, of course, will be.

The anthracite steam sizes are being offered very freely throughout New England and in every manufacturing center reached by the hard coal roads. Eastern consumers who have never yet used pea, buck or rice are now considering changing the grates in a portion of their plants to burn these sizes. The extent of the anthracite steam tonnage must have an effect on the market for bituminous steam coals, and it will probably be found that the amount of anthracite available, and the prices at which the coal is offered, will check any panicky advance in bituminous that might follow the car shortage expected during the fall and winter. The steam sizes are hard to market, and it has been deemed necessary by producers to reduce prices in an effort to induce buying. The Reading Company cut their contract figures to 50 cents below the circular for all pea and buck delivered during August on line and city business, making them $1.75 and $1.25 respectively at the mines. The Pennsylvania followed this lead, but these reductions scarcely bring the prices down to the level at which these sizes are being sold by the individual owners. Dollar buck is freely mentioned; and freshly mined coal is meant, not the washery variety.

The Philadelphia textile strike shows signs of disintegrating, and the resumption of 300 odd plants now idle will use up some of the surplus buck and pea in that vicinity. The movement of cheaper coals into use in steam plants is oftentimes retarded by a general unwillingness on the part of firemen to experiment with a new coal. They are loath to make a change and will advise against it. In one instance the engineer of a large plant contended with the dealer that his product was dearer in the end, stating it would require an additional fireman. The dealer succeeded in getting the firm to make a test, keeping a careful account of results, and in the end the engineer acknowledged that he was in error and recommended using the coal urged. As to the relative values of different grades of coal, there is room for difference of opinion, but it seems that too often engineers and firemen are content to stay by that to which they are accustomed, and are unwilling to consider a new article.

Bituminous or Soft Coal.

Soft coal prices have shown a decided downward movement within the past month or six weeks, and there is considerable discussion as to what is needed to put the seaboard bituminous trade on a better basis from the producers' standpoint. While some point out the growing concentration of interests as a means that will eventually adjust matters, by putting the ownership in few hands, it is realized by others of less patient character that something more radical should be done. The time seems to be ripe for some one of aggressive policy to take the lead in outlining a plan of action for the bituminous producers, as the present season has been one of the most unsatisfactory on record. While prices are generally fair, there is much raggedness to the market, and this is particularly disappointing to the producing companies in view of the admittedly good business conditions in other lines. The point is that the trade undertook to accomplish too much, without having the requisite cohesion to achieve its purpose. Another year either a less ambitious policy as to prices must be marked out, or means taken to hold all interests together throughout the year. It is not necessary that a price should be fixed—that is looked upon as impracticable—but a series of prices might be fixed which would have regard for the different varieties of coal, and the demand for them, and take into consideration the condition of demand and supply at various seasons of the year. This would be of most decided advantage to consumers, for, as it has been this year, the party who contracted early is not in so favorable a position as the concern that took the risk of the open market in regard to its fuel.

In the Western Pennsylvania soft coal districts there is already the cry of shortened transportation facilities, but this is for the reason, perhaps, that the Northwest is taking more coal this year, as the railroads there are busy, and expect to continue so, in the handling of the crops; they need coal. Coal tonnage is being put out to the full limit of the car supply, which is much behind the requirements, and which shortage is annoying to the mine managers and company officials. While the tonnage already sent forward is considerably ahead of the amount at the same date last year, it is, nevertheless, short of what was hoped would be the case, and promises a shortage at the upper docks unless navigation shall remain open until late in December for the Lake Michigan ports.

Earnings of the Pittsburgh and the Monongahela coal companies are reported to be much higher than at the same time last year. The statement issued by the Pittsburgh Coal Company for the first six months of the current year ought to inspire some confidence in the condition of business in this country. The increase of net earnings for June this year is nearly 50 per cent., as compared with the net earnings for June of last year. The net earnings for the first six months of the year are more than double those of the first six months of last year. The net earnings of the first six months of the year will pay interest on the bonds and the preferred dividend for the entire year.

There seems to be no end to the operations projected in various sections of the country looking to the furnishing of a supply of coke. The foremost in this direction is the enterprise known as the National Coal & Coke Company. In this company a number of the officials of the old Frick company are interested, and they will pick up the scattered threads of the former company as expeditiously as possible, and serve the trade in the same manner as under the old corporation. It is intended to expand the trade by making a special effort to supply domestic and other consumers with crushed coke, as well as to undertake contracts for blast furnaces, foundries and other manufacturing consumers. It is also expected that a considerable trade can be developed for the coke supply of locomotives in use for shunting cars in cities, in which, because of the continued uproar and protest about the smoke nuisance, legislation is being agitated to forbid the use of raw soft coal. Other companies are looking into the possibilities of this expansion of the demand for coke, and a careful study of the growth of coke for use as a domestic fuel, especially for house heating, furnaces and boilers, has been made, which is said to indicate a growth of the use of coke in these directions that justifies greater energy to push it than has been done in the past. Hitherto this trade has been a precarious and uncultivated growth; now it is purposed to nurture it with judicious and well directed energy.

Coke business is on the mend for the better grades, but good furnace cokes from the West Virginia smokeless regions can be bought either for present or future shipments at $2, at oven, while high sulphur coke can be bought at $1.65, at oven. The tendency of foundry coke is downward, and it is stated that foundrymen can secure contracts running six months at $3, at oven, though $3.50 and $3.75 are the quotations that are more commonly heard.

The Steel Corporation's Recent Ore Land Purchase.

DULUTH, MINN., August 15, 1903.—The importance of a purchase of iron ore lands upon the Mesaba range recently made by the United States Steel Corporation can scarcely be overestimated. This deal has been under way for some months, and I am now able to announce its culmination. It takes off the open market what is practically the last really large and important single block of Mesaba ore that was for sale, and by just that much strengthens the Steel Corporation's position as to ore reserves and diminishes the possibility of any new and large steel making competition.

As has been pointed out more than once, the possession of large, easily mined, high grade and cheaply reducible ores of a variety of characters is absolutely necessary for the successful operation of any steel making enterprise at the present day. It would surely be difficult to-day to procure enough ore fulfilling all these conditions and so located that the cost of transportation would not be too great a handicap to justify the expenditure necessary for the construction of really important Bessemer steel works and mills anywhere in the region supplied from Lake Superior without raking together about everything in sight. The United States Steel Corporation have, for some time past, been moving toward the point where this statement might be made, and they have gone about the great task with the skill and acumen that has at all times characterized their ore and mines business.

Developed ore bodies, of as high as 4,000,000 or 5,000,000 tons each, and of varying grades and physical characteristics, are now to be had on the Mesaba range. Doubtless many more are to be found later. But these all combined are not large when compared to some of the Steel Corporation's great mines. There can to-day be found, on the Mesaba range alone, explored deposits covering collectively possibly 20,000,000 tons, all of which might be sold. Some are high grade Bessemer, some very cheaply mined, and nearly all without restrictions as to traffic, &c. But these properties are not pressing on the market, and are not held *en bloc*, as were the great holdings just sold.

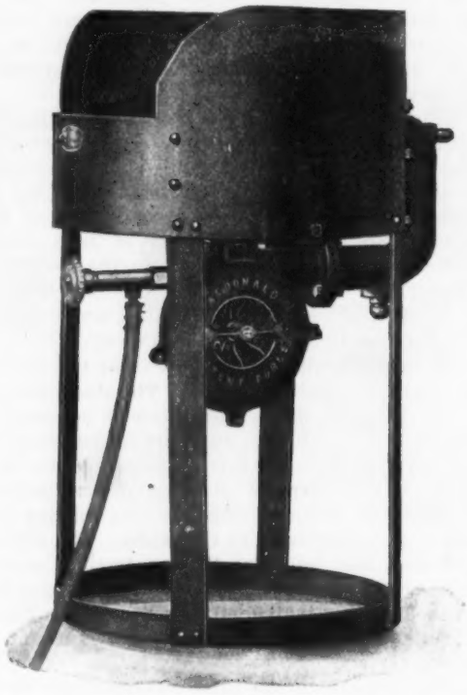
The new purchase, the relative importance of which is pointed out above, is that of the entire holdings of the Chemung Iron Company of Duluth. These holdings include 11 more or less fully developed and as yet entirely unmined tracts, which have passed bodily into the hands of the Steel Corporation. In all about 70,000,000 tons of ore of excellent quality, much of it a high grade Bessemer, much of it cheaply mined, much of it exceptionally tractable in the furnace, has been measured up on the lands sold, while there is every reason to suppose that this figure of tonnage does not nearly cover all that may eventually be mined from these lands. The lands are mostly leased properties on a basis of 25 cents a ton royalty, and the minimum annual requirements are not exceedingly large for such a consumer. So the deal gives the Steel Corporation an immense addition to their ore reserves of good character at no undue costs. The Chemung properties include some very fine deposits, one of them in particular ranking well to the front of Mesaba range mines, with all that term implies. Some of the deposits average up to 62 and 63 per cent. iron and down to 0.035 per cent. phosphorus. Some are stripping some milling, some underground.

The Minnesota Iron Company are now carrying out preliminary work toward the opening of one of these properties called the Monroe, and situated in the quarter of section 28, T 58 R 20. They have planned to sink two or three shafts and do much stripping in order to open a large milling pit. The surface is not extremely heavy, and a very large tonnage can be mined at reasonable cost by the milling system. If suitable arrangements can be made as to stripping charges, &c., this may be a shipping property the coming season.

The properties include the Chemung and Monroe, in section 28, T 58 R 20, the Myers in section 22, the Niles and Pettitt & Robinson in section 27, the Palmer in section 13, same township; the McEwan in section 4, T 58 R 17; two 40-acre tracts in sections 19 and 20, T 59 R 14 and the Longyear & Bennett, in section 35 T 58 R 21. The Chemung Iron Company were owned by Henry W. Oliver of Pittsburgh and Chester A. Congdon of Duluth. Fee title to several of the properties is owned by the Monroe Iron Company of Duluth, of others by R. H. Palmer, the Niles Land Company, the Minnesota Commercial Loan Company and others. The chief fee interest is, however, Pillsbury, Bennett & Longyear, whose ore holdings in this deal foot up not far from 30,000,000 tons. R. H. Palmer, D. T. Adams, C. M. Hill Lumber Company and Monroe Iron Company, all of Duluth, collectively owned a large block. D. E. W.

The Chicago Air Forge.

Novel construction is embodied in the new air forge built by the Chicago Pneumatic Tool Company and here illustrated. The hose connection, through which the air enters the forge, is ¼-inch pipe. The air, passing through



THE CHICAGO AIR FORGE.

a 1-16-inch needle valve, revolves the fan rapidly, and as the fan is open to the outer air a blast of free air is continually blown through the tuyere. The makers state that this method of using air to operate the fan, in addition to giving excellent results, effects a considerable saving in the amount of air consumption. This machine uses either coal or coke. It operates with an air pressure of from 60 to 100 pounds, and consumes approximately from 5 to 7 cubic feet of free air per minute. The fan revolves at about 4000 revolutions per minute at 80 pounds pressure. The forge is 3 feet high over all, and the pan, or fire box, is 20 inches in diameter by 10 inches deep. It weighs 114 pounds complete.

Old Fish Plates Are Not Scrap.—The United States General Appraisers at New York have decided that old fish plates, not having lost their character or identity as such, are not dutiable as scrap iron or scrap steel under paragraph 122, act of July 24, 1897, but are dutiable at the rate of 45 per cent. ad valorem under paragraph 193, as manufactures of metal. The decision was rendered in the case of R. L. Ginsburg & Sons, who had made importations at Buffalo. The decision says that while it may be true that no railroad company would purchase these articles for use as such, it may be that others using rails, such as contractors or planters, might use them. At any rate they are still fish plates and have not lost their character or identity as such."

Annual Meeting of the International Acetylene Association.

The sixth annual meeting of the International Acetylene Association was opened at the Hotel Stratford, Chicago, on Monday, August 10, with President George Landis Wilson in the chair. After the roll call, the president addressed the association. His speech was, in part, as follows:

The sixth meeting of this association, in my opinion, finds it in better condition than it ever has been in the past. We have more money on hand and more outstanding dues, which we consider good. The past year has seen the addition of a number of good members, and the membership of this association is constantly getting more and more representative of the industry as a whole. I believe that the total number of people in the business—that is, as manufacturers—is being decreased legitimately. It scattered too much in the beginning, and the result was that many became discouraged and fell out. The past year has seen more of the installation work than ever before, and there has been more, in percentage, increase in town lighting—small towns that cannot afford the electric light plant on a proper basis, and where a regular city gas plant is out of the question.

The extension of railway car lighting has been astonishing, when we consider the difficulties which were encountered from that class of work, and to this association the extension of railway car lighting is an important matter, because it secures more and more people constantly coming in contact with the acetylene light, and every time they see it they become friendly to it.

The relation of insurance to acetylene is the most important matter that we face to-day, I think. The National Board of Fire Underwriters, through its Executive Committee, has decided, as I understand it, that during the year acetylene will be penalized; that is, if the installation is inside of insured premises, and I can see of no way to meet that excepting for this association to put up a united front. Some time ago, the insurance companies determined that all acetylene installations must be outside, and had their rules so prepared; they had conferences with various people prominent in the business; the engineers and underwriters' laboratories had been instructed to prepare the rules in that shape. But while it was a thing that was directly opposed to the recommendation of many of our members, your officers decided that they would not accept any such thing, and the result was that the rules as promulgated still continue to provide for the installation of generators inside insured premises in those parts of the country where they are likely to freeze. That is all we want, and it would appear that the only thing for us to do is to present the same kind of a united front, and at this time, if possible, defeat this attempt to put this arduous condition upon our business, because it is absolutely unwarranted by the facts.

The Louisiana Exposition has commanded quite a good deal of attention from committees of your association. It is well, perhaps, to explain to those of you who are not familiar with the exact circumstances down there that the rules of the Louisiana Purchase Exposition prohibit the use of any gas in their buildings; if I understand them right, even gas through mains. Electric light is the only light that is permitted under their rules, so that it is not so much of a reflection upon acetylene, perhaps, as might be considered. They have, however, seen fit to prohibit live exhibits at the Louisiana Exposition of acetylene apparatus.

Your committee attempted to take up this matter, and their report will cover it fully, but it is sufficient to say that they have not met with the success we had hoped. Any exhibit there will involve the erection of a building, which will be quite expensive, its maintenance, &c., and we cannot look to the Exposition for the assistance which the importance of the acetylene industry warrants. I do not know just what the underlying reasons are, but it is perfectly evident that there is an antagonism in the Board of Directors of the Louisiana Purchase Exposition, and a favoring of electricity which we cannot overcome, or at least have not been able to up to the present time.

The acetylene business generally, I believe, we may say, has been improving; that is, it is in a more healthy condition. Generators are being placed constantly, and there is less of the wild cat element in the business than was faced a few years ago. I believe the tendency will continue to improve, and there is bound to be an improvement along these lines, because acetylene of its own merit is going to secure wider and wider recognition.

Reports of Committees.

Immediately following the president's address, the Committee on Resolutions were appointed and report of the Press Committee was made.

The Committee on the St. Louis Exposition reported that they had called on the Exposition officials and found it impossible to induce them to appropriate any moneys for a separate building for acetylene; also that it was impossible for the manufacturers to exhibit the acetylene generators in operation in any of the buildings of the Exposition company. The committee were informed that if the acetylene generator manufacturers would make a proposition in definite shape as to how much they would contribute for the erection of an acetylene building and its maintenance in the grounds of the Exposition company the matter would be presented to the directors of the Exposition company for their consideration. The committee found it impossible to secure a sufficient number of pledges for financial support, so that the committee were unable to push the matter further. Through the efforts of the Union Carbide Company, a separate space has been set aside in the manufacturers' building for the use of the manufacturers of acetylene, and a certain space to be lighted by acetylene gas by a pipe from an outside plant has been arranged for.

Papers Read.

The following papers were read and discussed:

"The Possibilities of Acetylene Town Lighting," W. C. Heimbeucher, Chicago.
"Acetylene Town Lighting as an Investment—a Western View," A. L. Bartholomew, Preston, Iowa, an owner of town plants.
"An Eastern View of the Same Subject," Noble Bennett, New Milford, Conn., another owner.
"A Southern View," A. L. Adamson, Manchester, Pa., still another owner.
"The Present Status of Acetylene Car Lighting," C. T. Hamm, Chicago.
"Difficulties Encountered in Acetylene Car Lighting," McDonald Elliott, Santa Rosa, Cal.
"The Application of Pressure Acetylene to Car Lighting and Yachts," E. G. Fisher, Chicago.
"How Shall the Acetylene Industry Meet the Insurance Man?" Arthur Yancey, New Orleans, La.
"The Application of Acetylene Light to Institutions," Augustine Davis, Elkhart, Ind.
"The Best Methods of Marketing Acetylene Generators," M. J. Carney, Chicago.
"What of the Agent in the Acetylene Field?" Elias A. Long, *Acetylene Journal*.
"The Application of Acetylene to Factories," A. C. Lotz, Chicago.
"Economical Trenching and Pipe Laying for Acetylene," Clarence King, Norwich, N. Y.
"Pioneers in the Acetylene Field," Geo. F. Owen, Grand Rapids, Mich.
"Novitiates in the Acetylene Field," Chas. E. Ummach, Chicago.
"Franchise Conditions: The Relation of the Town Acetylene Company to the Municipality," Frank Fowler, Waukegan, Ill.
"Acetylene Men I Have Met," W. R. Burling, *New York Journal*.
"Acetylene Observations in Europe," J. M. Morehead, Chicago.
"The Acetylene Agency: a Source of Profit for the Plumber and Fitter," P. W. Shute, Ypsilanti, Mich.

The secretary-treasurer's report was read, and showed an increased membership and a substantial balance in the treasury.

The election of officers resulted as follows:

President, J. B. Carroll, Chicago, Ill.
Vice-President, Henry Glessel, Wapakoneta, Ohio.
Secretary-Treasurer. G. W. Mead, Chicago, Ill.
Directors H. E. Shaffer, Rochester, N. Y.; Geo. Landis Wilson, Chicago, Ill.; Geo. F. Owen, Grand Rapids, Mich.; I. L. Harris, Chattanooga, Tenn.

The next meeting of the association will be held in August, 1904, at St. Louis, Mo.

Judge George W. Ray, in the United States Court at Binghamton, N. Y., has handed down decisions in three important actions against George R. Bidwell as Collector of the Port of New York, brought by importers to test the Dingley Tariff law and the Foraker law. The decision finds that Porto Rico and the Philippines ceased to be foreign country on April 11, 1899, when the ratifications of the treaty of peace with Spain were exchanged, and not at the time the treaty was ratified; that no duties could be assessed on imports from these islands after that date. The decision involves many thousand dollars.

The bulk of the foreign carrying trade of the Philippines continues under the British flag, upward of 75 per cent. of the exports and 60 per cent. of the imports, including practically the whole of the trade with the United States, being carried in British ships.

Lake Ore Matters.

The Negaunee Mine.

DULUTH, MINN., August 15, 1903.—Final payment of the $1,500,000 bonus for the Negaunee mine's lease has been made to the fee interests, and on September 3 the property passes into the hands of the Cleveland Cliffs Iron Company. The Negaunee mine has a remarkable history. Twenty years ago a lease was made by its owners, Mitchell, Maas & Lonstorf, to the Cleveland Rolling Mill Company at a royalty of 25 cents a ton. Five years ago this company sold their lease for a bonus of $650,000 to the American Steel & Wire Company, and it was then thought that it would be a mere matter of form to renew the lease at about the same terms. During the ownership of the American Mining Company, and before the organization of the United States Steel Corporation, the property was in bad shape and scores of thousands of dollars were spent in repairing the mine and making it safe. On the very eve of possession by the United States Steel Corporation the mine caved, a number of men were buried, and the old shaft was ruined. But a second shaft had been under way, the property was quickly put into condition and has been a large producer since. Its output is now about on a 200,000-ton basis. During the operation by the Steel Corporation the latter purchased from Capt. Samuel Mitchell a fifteenth interest in the fee, and it was feared that this might complicate the situation. A lease was given a year ago of the remaining fee interest on the basis of a bonus of $1,500,000 and a 30-cent royalty, with a large minimum, to the Cleveland Cliffs Company, and recently the minority interest in the fee joined in this. The Negaunee is still a very large property with many million tons of ore in sight, and is in far better shape for economical and extensive mining than when the Oliver Iron Mining Company took possession for the Steel Corporation. The location of the property, in connection with the large surrounding holdings of the new lessee, and with the latter's new Maas mine adjoining it, is such that the Cleveland Cliffs Company are able to make more from this mine than any one else could have done, and this was recognized when their large bonus was paid.

Mesaba Range Happenings.

The Consumers' Ore Company, a new mining company with $300,000 capital and backed by M. A. Hanna & Co., have just closed a deal for several tracts of State land in T. 58, R. 18 and 19, that were in possession of A. Maitland. They will proceed with mining. One of these tracts contains a considerable tonnage of good ore, the others are of less consequence. This is about the first move of this large firm toward securing Mesaba range interests. Three of four rather important Mesaba explorations have been under way this year and have resulted in the discovery of some deposits of ore running up to from 2,000,000 to 4,000,000 tons. Some of these are to be mined by their lessees, and others will probably be on the market after a time. It is not unlikely that the important sale of ore properties to the United States Steel Corporation, elsewhere referred to, may stimulate inquiry for developed properties.

Mesaba shipments show no material change from the past few weeks. Stock piles have not yet been cleaned and at some mines are not going very fast. The La Belle mine near Sparta is closed so far as shipments are concerned.

A large stripping pit has been dug at the Adams mine of the Steel Corporation this summer and is completed and connected, so that shipments have begun. There was 65 feet of surface over the ore at this point. The pit will add materially to the ease of producing the large tonnage secured from this property. The Adams last year shipped 1,782,000 tons of ore, every pound of which was hoisted from underground. This record has never been approached. One and a fourth million tons were hoisted from four shafts of the Adams portion of the mine and 543,000 from its Spruce shaft. The mine is developed for an enormous product and is making it with exceedingly low cost.

On the Mueller tract, in section 15, T. 58, R. 19, which has been in the courts for some time, the Oliver Iron Mining Company are exploring under their option taken before the title was questioned. Several holes are in ore, and it looks as though the property were valuable. The Oliver Company have the right to purchase this property outright for a very reasonable sum. It is claimed that the Mueller claimant will reopen the case, but the title under which the lessees are at work seems impregnable.

Marquette and Menominee Ranges.

Princeton mine, at Swanzey, is looking very well. A new shaft is down 200 feet and will be driven much deeper. The mine will make a good output this year and is becoming a large property. At Maas mine, Negaunee, power drills are now working successfully and rapid progress is made. Appearances at the new finds in Marquette district, where the Cleveland Cliffs' Austin mine is located, are excellent, and the prospect is bright for some good deposits thereabouts.

Menominee range affairs are quite dull now, owing to the suspension of most of the exploration work that had been under way and the temporary quiet of several mines. Shipments are slow, which adds to the dullness apparent in the mining towns.

Copper.

July figures of production in the Michigan copper country are not such as to lead to the enthusiastic statement of a year's output exceeding 200,000,000 pounds. August is running about as July did, or 15,000,000 pounds for the month. Delay in receipt of machinery is accountable for part of the falling off, a production less than estimated by at least 250 tons of rock daily at Calumet & Hecla for part, and a lack of inducement for high outputs for more. Calumet & Arizona, the new property in southern Arizona, is frequently making more than 100,000 pounds per day. Copper Queen is fast completing its 3000-ton smelters at Douglas, Ariz., and is to sink additional shafts that will put its production well ahead.

D. E. W.

The New England Wire Trade.

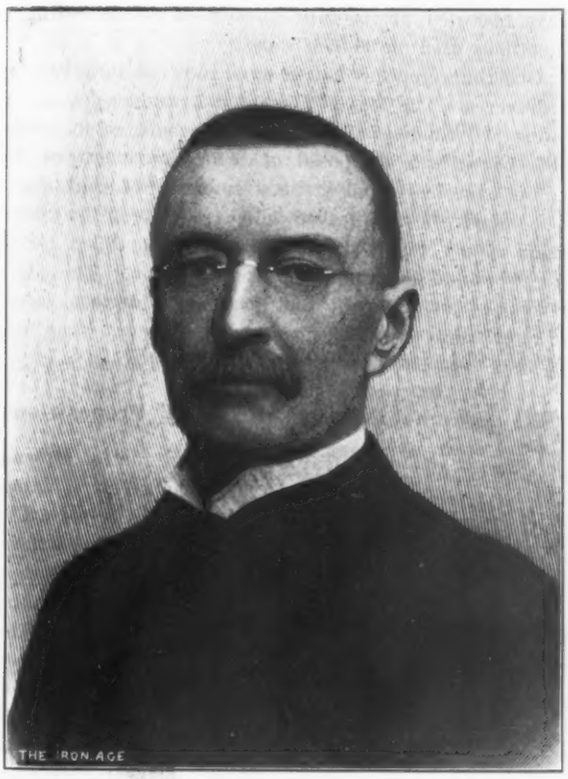
The wire business in New England has not felt the depression which is reported from other branches of the metal trades. The Worcester works of the American Steel & Wire Company are having an almost unprecedented summer rush of business. The independent wire manufacturers of Central Massachusetts make much the same report. The National Wire Corporation of New Haven, Conn., one of the constituent parts of the National Steel & Wire Company, report business exceedingly good; so good, in fact, that they are compelled to buy large quantities of wire to keep up with the demand for their specialties. Officers of these companies can give no reason that they consider adequate for this long continued rush of orders, unless it is, as they put it, that wire is being used for more and more purposes each succeeding season. All of these New England companies, in common with wire manufacturers elsewhere in the United States, have greatly increased their capacity for production within a short time, yet most departments must be kept running night and day to enable them to meet orders.

The plans for the establishment of a car building plant at Tacoma, Wash., have assumed such shape that we can now officially state that the works will be erected without delay. A committee has been appointed to select a site. Plans and specifications for the buildings and equipment will soon be ready, and it is expected that contracts will be let within the next few weeks. The plant is to be operated by the Pacific Car Works, which were recently incorporated with a capital stock of $200,000. The officers are: President, George W. Dickinson, president of the Alarca Central Railroad, Seattle; vice-president, E. M. Wilson, president of the Lake View Rolling Mills, Lake View; secretary and treasurer, S. J. Maxwell, Seattle.

The Hunt Foundry & Machine Company, New Kensington, Pa., have assigned, with $25,572 liabilities, and assets, $72,380.

James H. Reed.

An important part of the action taken at the recent meeting of the directors of the Carnegie Steel Company, which was not generally anticipated, was the creation of the office of chairman of the board and the election of Judge James H. Reed to the position. This office was last held by H. C. Frick, but when he retired from the company it was abolished. Since that time the duties of the chairman of the board have been filled by the president of the company, and it was hardly expected that there would be any change. The position is principally an advisory one, and Chairman Reed will preside at all meetings of the board.



JAMES H. REED.

The Buhl Club of Sharon, Pa.

Charles L. Cummings of Braddock, Pa., has been appointed librarian of the new Buhl Club, which will be housed in the handsome building now being erected at Sharon, Pa., by Frank H. Buhl, former president of the Sharon Iron Works, Buhl Steel Company and Sharon Steel Company, all of which are now controlled by the United States Steel Corporation. The building, when finished, will have cost Mr. Buhl about $250,000. The donor states that his gift to Sharon is intended for rich and poor alike, that there will be no classes, and every one will be welcomed to enjoy all the benefits that can be had in the building. He says that if half a dozen young men are kept out of bad company for a year by spending their evenings in the institution, he will consider it a good investment. The librarian, Mr. Cummings, has taken charge and is arranging for the formal opening and dedication of the building in October.

Arrangements have been completed for holding the third annual convention of the American Aluminum Association at the Murray Hill Hotel, New York City, on Wednesday and Thursday, September 2 and 3. The programme includes a business session in the forenoon of Wednesday, with an excursion in the afternoon to Glen Island, where a short dinner will be served. Another business session will take place on Thursday morning, and the afternoon will be devoted to an excursion to Coney Island and a dinner at one of the beaches. It is expected that there will be a full attendance of members at this meeting, most of them having already signified their intention of being present.

Statistics of the Electric Light and Power Industry.

S. N. D. North, director of the United States Census Office, has issued a preliminary report on the statistics of the electric light and power industry, as compiled by W. M. Steuart, chief statistician of the Department of Manufactures, T. C. Martin being special agent associated with the work. The figures given below are for the results at the end of the year closing June 30, 1902. The report includes central stations only, and does not embrace any isolated plants, plants operated by electric railway companies or idle plants, or plants under construction. Municipal plants represent about one-fifth of the total. The street railway census, issued some time since, showed 118 trolley companies to be in the light and power business, earning gross from it $6,469,726, and that all told this item, including sale of current, reached $7,703,574.

Central Electric Light and Power Plants.

Number of establishments	3,619
Cost of plants	$502,181,511
Earnings from operations, total	83,585,410
From light service	69,731,931
Arc lighting	25,459,437
Incandescent lighting	44,272,494
All other electrical service	13,853,479
Income from all other service	1,560,013
Gross income	85,145,423
Expenses:	
Total	67,688,075
Salaries and wages	20,551,989
Supplies and materials	22,814,758
Rent of stations and offices	1,285,546
Taxes	2,654,065
Insurance	886,445
Miscellaneous	6,994,227
Interest on bonds	12,501,045
Power plant equipment:	
Steam engines—	
Number	5,921
Horse-power	1,377,041
Water wheels—	
Number	1,378
Horse-power	381,134
Generating plant:	
Dynamos—	
Direct current, constant voltage—	
Number	3,820
Horse-power	441,621
Direct current, constant amperage—	
Number	3,537
Horse-power	195,431
Alternating and polyphase current—	
Number	5,106
Horse-power	978,428
Output of station:	
Kilowatt hours—total for year	2,437,218,732
Line construction:	
Miles of mains and feeders	12,470,494
Lighting service:	
Arc lamps	385,208
Incandescent lamps	18,006,521
Average number of employees and total salaries and wages:	
Salaried officials and clerks	6,976
Salaries	$5,632,880
Wage earners	23,258
Wages	$14,919,109

The final report will present detailed statistics by States and for other phases of the industry. The statistics for this industry at the census of 1890 were confined to the State of New York, the city of St. Louis and the District of Columbia, therefore no comparison can be made with the totals for the United States. In other words, these are the first and only authentic figures of the industry in America.

It is reported that another effort is being made to form a combination of the malleable iron plants of the country. Former efforts have been unsuccessful, owing to the fact that the National Malleable Castings Company, the largest concern of their kind in the country, would not enter a combine. It is said that the new combination will be composed of all the other malleable iron plants outside of the National.

The Iron Age

New York, Thursday, August 20, 1903.

DAVID WILLIAMS COMPANY, - - - - - - - - PUBLISHERS.
CHARLES KIRCHHOFF, - - - - - - - - - EDITOR.
GEO. W. COPE, - - - - - - - - - ASSOCIATE EDITOR.
RICHARD R. WILLIAMS, - - - - - - - - - HARDWARE EDITOR.
JOHN S. KING, - - - - - - - - - BUSINESS MANAGER.

Wire Cables vs. Eye-Bar Cables for Bridges.

Like the mirth of King Richard and Friar Tuck, the controversy relating to wire or link cables for the Manhattan Bridge, New York, has become "fast and furious." The advantages and disadvantages of both methods of construction have been discussed from every point of view, the advocates of both sides showing a positiveness of conviction that is truly remarkable. One side can see absolutely nothing good in the plans of the other, and each disputant is visibly angry because his own ideas are treated with marked disrespect. Every point, from the manufacturing of the steel to estimating the probable life of the structure, has been gone over and threshed thoroughly. And the end is not yet.

W. Hildenbrand, who can certainly speak with authority on wire cable work from his experience on the old Brooklyn Bridge and on the new Williamsburg Bridge, states in a letter to *Engineering News* that eye-bar chains are seven and a half times heavier than wire cables, and that the total dead load of a chain bridge is 82 per cent. more and its total cost $5,280,000 more than that of a wire cable bridge. Mr. Lindenthal, the designer of the bridge in question, stated that the nickel steel for the eye-bars had an ultimate strength of 85,000 pounds and an elastic limit of 45,000 pounds, and that the No. 7 cable wire would have a tenacity of 190,000 pounds and an elastic limit of 150,000 pounds. To this it is replied that the best average qualities of nickel steel furnished by the American Bridge Company have a tensile strength of 75,000 pounds and a yield point of 45,000 pounds. Concerning this wire the statement is made that the tenacity of the No. 6 wire used in the Williamsburg Bridge is 223,860 pounds, with an elastic limit of 190,000 pounds. Mr. Hildenbrand states that these figures are the average of 16,500 tests added up by himself. He also says that while an eye-bar chain bridge is practicable from an engineering point of view, it is a very uneconomical form from a financial standpoint.

We now find a disputant who brings forward the æsthetic factor in the problem, and who says that no one can compare the new plans with the two existing bridges and not pronounce the Manhattan the ugliest of the three. This is undoubtedly true, and it is also true that engineer and layman agree that the Williamsburg Bridge —wire cable—is as unattractive a structure as ever spanned a river.

It is pronounced next to impossible to prevent corrosion and wear of the joints of groups of eye-bars united by pins. It is also a matter of the greatest difficulty to make each strand of an eye-bar chain bear its correct proportion of the load, a cause of no trouble in the construction of wire cables. As a probable solution of the matter our contemporary proposes that bids be invited on plans with eye-bar chains and with wire cables. Mr. Lindenthal states, in reply to this, that the design for the eye-bar chain, with positive pin connections for the web members, cannot be adopted for the straight wire cable. A separate strain sheet would be required for the wire cable design, for the same form of stiffening. The same strain sheet could not be used indiscriminately for chains and cables. G. C. Henning brings forward the statement that wire can be made by a number of concerns, while "there is not now in existence in the world any machinery adapted for making eye-bars of the dimensions given," and "there is not now in existence any apparatus by which the testing machine [which would have to be built] can be calibrated." Mr. Henning says that as the machine could only be used on this job its entire cost, or at least 50 per cent. of it, would be charged to the eye-bars. He apparently overlooks the fact that a machine, even a testing machine, is not always operated at its full capacity—a 60-inch lathe is sometimes used on 30-inch work.

One thing appears not to have received the attention it deserves. The Mayor appointed a commission to examine Mr. Lindenthal's plans for a chain cable bridge. This board was composed of bridge engineers of the widest experience and greatest integrity of character—men known the world over for the work they had done. Their report indorsed the plans in unqualified terms. Their opinion is entitled to consideration. The plans have been adopted, but the Board of Aldermen refuse to appropriate the money, and no man knows when bids are to be asked for.

The Automobile as a Business Proposition.

There is reason to fear that the building of automobiles as an industry has been handicapped by a wrong start. This is to be regretted. The business is one which promises a legitimate development to large proportions, and with an element of permanency much greater than resided in the manufacture of bicycles. The potential demand for motor vehicles of all kinds is beyond estimate. That it is least and most capricious in the lines which have thus far chiefly attracted the attention of mechanics, inventors and manufacturers would be surprising if it were not characteristic of all developments that what is first attempted is that for which society in its then present state of civilization has least use. The inducement of the very high prices which a few purchasers are willing to pay for "Red Devils" and "White Destroyers"—machines capable of making on common roads the speeds of locomotives on rails, has distracted attention from the more important and profitable problems of safety, durability, economy of operation and comfort in use. It is not our purpose in this reference to the subject to discuss the mechanical problems of the automobile, but to look at the subject wholly from the business point of view.

There is every reason to believe that the motor vehicle in one or many of the several forms in which it has become familiar has "come to stay." For the excellent reason that oats and hay cost more than coal the horse has lost the confidence of every one who studies economy in transportation or the handling of merchandise. He certainly has his limitations, and they are well defined. That he has done good service in the world since the days of his differentiation from the hipparion is undoubtedly true. It is also probably true that for a long time to come he will continue to render a service of value as a plaything, a servant, and an article of food in one form or another. Equally true is it that the lateen sail has played an important part in the commerce of the world, and still moves a very large part of the tonnage of the Orient, serving its purpose very well; but the steam engine has effectually displaced it from the commerce of the seas, and before we are quite through celebrating the triumphs of the steam engine over wind and tide it may, in turn, be displaced by some more efficient and less bulky motor. For 200 years the automobile road carriage has

been sought diligently by inventors, and the gradual progress toward its attainment in practical form marks the advancement of the mechanic arts. This groping after a self propelling vehicle—self propelling in the sense that it does not have to be dragged by animals—represented an honest if somewhat erratic and spasmodic effort to meet a want which has always existed, but has only lately been recognized as imperative. As an economic proposition it would not be difficult to establish the thesis that the demand for food for human beings is too great, continuous and increasing to admit of the surrender of so large an acreage of cultivated land to the raising of food for horses; and since the horse is by no means an efficient machine, being initially expensive, extremely liable to derangement in his working parts, difficult and costly to repair, and of very little value when seriously damaged, and being, moreover, self-wearing-out, so to speak, in the sense that his usefulness is quite as much a function of age as of mileage traveled or work performed, it may be truthfully said of him that his "statistical position is extremely weak." The argument is wholly in favor of the motor vehicle for every purpose for which vehicles are employed, and it becomes unanswerable when applied to cities with narrow and congested streets, in which horses take up as much room as the vehicles they draw, and contribute more than any other cause to the befouling of pavements and the burdens of municipal sanitary policing.

With the opportunities in its favor which these and many other considerations create, the business of developing and building practical types of motor vehicles should have already become one of the most important and profitable of industries. That it is still in its initial stages is due in large degree to the fact that its development has been along lines almost diametrically opposite those which would permit it to satisfactorily meet the great demand for the replacement of horses. A speed which only those afflicted with the disease of "motor intoxication" desire, which is far greater than is permissible in cities or than any form of country road is adapted to, which entails enormous weight, great cost, expensive maintenance and excessive physical danger to all concerned, has been the standard which most of those who have engaged in this industry have struggled to attain. It is doubtless true that most of those who use automobiles for pleasure would not have taken interest in them if they had been less dangerous to themselves and others and more practical as vehicles for use in civilized communities where some consideration is given to the safeguarding of life and limb; but the demand from this source is but a fractional per cent. of that which is wholly unsatisfied by what has thus far been offered. Moreover, the dangers of high speed on roads over which no exclusive right of way is possible have created in the public mind a prejudice against the motor vehicle as an impractical racing machine. This makes it popular with the smart set, but it equally makes it unpopular with the right minded, self respecting citizen, who does not wish to be classified with those who find pleasure in the distinction of being considered public nuisances. At present every community is on the defensive against the automobile. Legislatures are enacting special repressive laws against it, and cities and towns are giving these such efficacy as may be by superposed ordinances. The futility of these proceedings is made apparent daily. Those bitten by the tarantula of motor madness care no more for the law than they fear its penalties. To bail one's chauffeur out of jail and pay his fine, or, if he is deprived of his license, to pay his fare to another State and get a new one, is no great hardship. The thoughtful citizen, who realizes that no one—not even himself—can be trusted with the power to exceed the safe and statutory speed limit by a mere turn of the wrist without being irresistibly drawn to do so, often in ignorance of the actual degree of acceleration thus induced, looks at the automobile askance, and wisely concludes to defer using it until public opinion is somewhat less excited on the subject of reckless speeding.

Furthermore, if the average citizen has good judgment in matters mechanical he knows that speed and power-economy are antitheses, and that if he buys a machine adjusted to a speed of from 30 to 60 miles an hour, with the intention of running it at not more than 8 to 12 miles an hour, according to his roadway and the local laws he is bound to respect, he pays for mechanical refinements he does not want and which his servants, if not himself, will find dangerous. It is the same with horses. The overbred, overtrained racehorse, who can make his mile in 2.5 or less, has his uses in paddock and on track, but he is much less available for family use and general pleasure riding than the sturdy nag who will pull a carriage ten miles an hour, and he costs a great deal more to buy and keep. Most people admire a very fast horse, but there are some millions of intelligent citizens in comfortable circumstances who would not take the best of them as a gift on the condition of keeping and using it.

The manufacturer of automobiles cannot make the largest success open to him by a line of products which run counter to public opinion. He has pretty well exhausted the market for road locomotives, but has scarcely scratched the surface of that for comfortable carriages or useful wagons, with mechanism so governed that the statutory maximum speed of the locality where it is to be used is its limit. The means by which this regulation may be effected and changed as desired are many and simple. A practical delivery wagon for light merchandise which can be intrusted to a young man of the average intelligence and discretion of a driver, with the assurance that he cannot abuse the opportunity of scorching and, incidentally, involving his employer in damage suits, and perhaps even more serious liability for life or limb, would be worth more to the world and afford a better basis for a great industry than one which could break the records for high speed, fatality and violation of law. For each there is a market, no doubt, but they bear the same relation which the market for a useful implement bears to that for a lethal weapon—useless in war or the hunting field.

In view of the futility of laws and ordinances designed for the regulaton of motor vehicle speeds in streets and highways, there is a growing public sentiment in favor of such mechanical limitations of velocity as will render high speed impossible in licensed vehicles. There can be no possible ground of objection to this demand except on the part of those who desire and intend to break the law. It would seem to be good business on the part of the builders of motor vehicles to anticipate such a drastic requirement by offering vehicles which public opinion will approve. It does not, cannot, should not and probably will not approve the machine which can be made, and commonly is, a source of danger to all who use the public highways legitimately and with a proper respect for the rights of others. A great, profitable and stable industry cannot be built on any such basis.

The output of coal from the mines in Belgium during the first half of the current year amounted to 11,902,300 tons, as compared with only 10,931,840 tons in the first six months of 1902.

CORRESPONDENCE.

The Practical Aspects of Radio-Activity.

To the Editor: I was much interested in your editorial on "The Practical Aspects of Radio-Activity," in the issue of August 6, inasmuch as it suggests a possible resurrection of the dead theory of the transmutation of metals. In speaking of the small quantities of radium apparently available to man, you say, "If we could produce it synthetically from the fontal element, which now appears to be hydrogen, the matter would present itself in a very different aspect." I was taught in my chemical course that the doctrine of the transmutation of metals is not in itself improbable; but that as all means which man has ever tried to that effect have proved total failures, have given not the slightest indication of progress, it is extremely unlikely that it is a true doctrine. The accumulated experience of centuries is totally against the likelihood of the doctrine being a fact.

I have had in mind for about four years a method which may be able to accomplish what the old alchemists sought, to replace the mineral deposits that are now being recklessly exploited and consumed, and to make available for common use the valuable and practical properties of even the rarest elements. But I have hesitated to make it public for fear of that condemnation as a dreamer that would blight the progress of a young man in his professional career, together with a hope that by keeping silent I might some time be able to profit from the actual achievement of the old dream. Again, if the old idea were publicly proclaimed by as technically educated a man as possible, it would be likely to start research by those unfitted for the quest. Literature affords abundant record of the heartbreaking failures of the old alchemists. If my idea is correct only the most highly trained electrical specialist will be able to attain the goal. The time now appears to be near at hand when the idea may be practically tested, and so it should be advanced in order that the progress of the world should not be delayed.

One of the characteristic properties of the chemical elements is that of emitting light vibrations of definite wave lengths peculiar to each element. The dimensions of these light waves are supposed to depend on the mass and dimensions of the atoms of the elements. Physicists are now adopting the conception that the atoms we are familiar with are constructed of corpuscles, possibly all of one single kind of matter, and not more than one one-thousandth of the size of the atom. Can the aggregations of corpuscles that make up the atoms of one element be split up and reconstructed into other elements? The physicists say they are split up in electrical discharges. Can they be reconstructed? Some directive force is needed. I think it may be supplied if the thing be possible, by subjecting the corpuscles (or atoms made up of corpuscles) to light vibrations of the wave lengths of the element it is desired to construct. This possibility is supported by the principle of forced vibrations—*i. e.*, a body that would naturally vibrate with a given period will depart from that if subjected to sufficiently powerful vibrations of a different frequency and vibrate with the new frequency. Under such conditions the corpuscles might rearrange themselves to vibrate as atoms of the element to which the new vibration frequency is peculiar.

To test this idea we need apparatus to give a powerful supply of light vibrations of definite wave lengths. It is not in existence. All we have is the feeble supply that a spectroscope will separate out of a beam of light of mixed wave lengths, or the long electro-magnetic waves from oscillatory electrical discharges, which latter, while similar to light waves, are of too great dimensions to affect atoms. Even if powerful light vibrations of definite wave lengths should not effect the transmutation of the elements, the apparatus producing them would undoubtedly be of great practical value for other purposes, and repay the invention expelled in devising it. Such uses are, for example, an illuminant for microscopic investigation and photography, for medical treatment of various tissues, for effecting various ordinary chemical reactions, &c. HARRISON EVERETT ASHLEY.

LEETONIA, OHIO, August 12, 1903.

"Build" or "Manufacture."

To the Editor: In my opinion the most appropriate term, both as to idiom and exactness of the sense intended to be conveyed, is "construct." J. T.

NEW YORK, August 13, 1903.

Warning to Inventors.

We have received the following from a valued correspondent: The Patent Office *Gazette* publishes a record of all the inventions issued in this country, and there are concerns which take advantage of this fact to send out circulars lithographed in imitation of type writing to inventors, offering to sell their patents upon commission if intrusted to their hands. These circulars vary in their wording, but are false and specious from beginning to end, particularly when they assert, as many of them do, that they have had inquiries from "their clients" for just such patents. They also declare that they have agents actively employed in the "patent markets" who are able to capitalize and finance worthy patents if they are permitted to act as sole agents. They even go so far, in some instances, as to send printed forms assigning the patent to themselves for inventors to endorse, and on top of this demand a greater or less fee in advance, "for printing and advertising" and services rendered, whatever that may mean, for there is no service of any kind that is of value which they can or do render. There is no patent market, and no patents are in demand until time and use have proved their value. From these facts it is easy to see that there is nothing to be done by intermediaries that an inventor cannot do for himself. The number of these concerns must be large, for one inventor has received no less than 15 communications from as many different concerns promising everything and anything. Prudent men do not sign obligations or transfers of any kind from persons unknown to them who cannot be traced in mercantile agencies, and firms of standing do not make any such stipulations. Speciously worded documents of any character should be submitted to lawyers for solution. "Whosoever is deceived thereby is not wise."

Production of Oil in 1902.

The preliminary report of the United States Geological Survey makes the total oil production of the United States for 1902, 80,894,590 barrels, valued at $69,610,348. This is the largest quantity ever known in the history of the country. The production for 1901 was 69,389,184 barrels. At this rate of increase our production of crude oil will soon reach 100,000,000 barrels per annum.

The gain during the last year was 11,505,406 barrels in quantity, and $3,192,963 in value. This increase comes almost entirely from Texas and California. The product of these latter States sold at comparatively low figures, and brought the average value of the oil production of the entire United States down to 86 cents a barrel.

Ohio proved the leading State in the production of petroleum in 1902. California ranked second, with West Virginia third, Pennsylvania fourth, Texas fifth, Indiana sixth and New York seventh. The yield of Louisiana, Colorado, Kansas, Indian Territory, Kentucky and Tennessee was less than 2 per cent. of the total production.

Commerce between the United States and Canada was larger in the fiscal year just ended than in any preceding year. This is true both as to imports and exports. The figures of the year's commerce, presented by the Department of Commerce and Labor through its Bureau of Statistics, show that the imports from Canada amounted to $54,660,410, and the exports to Canada were $123,472,416. In this term is included British Columbia, Quebec, Ontario, Nova Scotia and New Brunswick.

Charles E. Pope, President of the Pope Tin Plate Company of Pittsburgh, Pa., will arrive in this country from Europe this week.

New England Foundrymen.

The New England Foundrymen's Association had "the time of its life" on Narragansett Bay Wednesday, the 12th inst., the occasion being the second of the outings which replace the regular meetings of the association in July and August. The Providence members had the outing in charge, and nothing could have been pleasanter than the clambake—the genuine Rhode Island sort, the ride down the bay on the chartered steamer "Pontiac," 30 miles to Newport, and the 12-mile ride about that city among the homes and haunts of fashionable folk, ending with the long and delightful sail home to Providence. The bake was at noon, and was followed by the photographing of the group, in which all of the 103 members of the party were gathered. It was considered absolutely necessary that the 103 should be shown to posterity, for the number was more than twice as great as the association has ever gathered together on any previous occasion when it has met for business or for pleasure.

The committee in charge consisted of the Providence members of the association, their representatives being A. J. Miller, Jr., of the Whitehead Bros. Company, chairman; E. J. Lyon of the Brown & Sharpe Mfg. Company; J. F. Blauvelt of the New England Butt Company; Charles H. Colvin of the Colvin Foundry Company; Herbert J. Burrough of the Builders' Iron Foundry; E. D. Williams of the Starkweather & Williams Company; Henry A. Carpenter of A. Carpenter & Sons Company, and Walter M. Saunders. The hospitality extended by these gentlemen was of the most generous character. The weather was delightful, every condition being perfect to see the beautiful bay and to enjoy the long ride about Newport. Luncheon was served on the boat during the return trip. In the party were:

Joseph L. Anthony and R. M. Leach, Weir Stove Company, Taunton, Mass.
A. M. Powell, Woodward & Powell Planer Company, Worcester, Mass.
Fred. A. Hoyt, Barbour & Stockwell Company, Cambridge, Mass.
W. D. Ballard, Coburn Trolley Track Mfg. Company, Holyoke, Mass.
L. W. Green and E. E. Durant, G. F. Warner Mfg. Company, New Haven, Conn.
A. J. Miller, Jr., Whitehead Bros. Company, Providence, R. I.
J. T. Maurau, Providence, R. I.
Henry A Carpenter, A. Carpenter & Son's Foundry Company, Providence, R. I.
B. S. Luther, C. H. Cowan and L. A. Grover, Atwood, Morris & Co., Stonington, Conn.
W. H. Baush, Baush Machine Tool Company, Springfield, Mass.
O. G. Thomas, O. G. Thomas & Co., Taunton, Mass.
C. Everett Evans, Evans Stamping & Plating Company, Taunton, Mass.
J. Bowie, Builders' Iron Foundry, Providence, R. I.
T. H. Landiegan, John A. Hayes, John F. Drury and F. F. Gaffay, Hayes Foundry, Lynn, Mass.
N. J. Kennedy, Arthur W. Gibby and George H. Carson, Mechanics' Iron Foundry, Boston.
G. D. Newcomb, Foxboro Iron Foundry, Foxboro, Mass.
M. L. Gay, Rogers, Brown & Co., Boston.
Arthur L. Goodnow, Goodnow Foundry Company, Fitchburg, Mass.
E. I. Welch, Fitchburg, Mass.
M. J. Perault, Perault Foundry, Fitchburg, Mass.
George H. Lincoln, George H. Lincoln & Co., Boston.
Charles A. G. Winther, Chapman Valve Company, Indian Orchard, Mass.
J. E. Plimpton, Norwood, Mass.
William L. White, Taunton, Mass.
H. W. Thomas and R. W. Whitmarsh, with G. Thomas, Taunton, Mass.
H. E. Pridmore and D. F. Eagan, Pridmore Molding Machine Company, Chicago.
William M. Cowan, General Electric Company, Lynn, Mass.
A. L. Lovejoy and W. J. O'Brien, Becker-Brainard Milling Machine Company, Hyde Park, Mass.
E. V. Hazard, Old Colony Foundry Company, East Bridgewater, Mass.
John Nelson, *The Iron Age*, Worcester, Mass.
A. E. Shields, Shields Foundry Company, Mansfield, Mass.
William T. Nicholson, Cutter, Wood & Stevens Company, Boston.
F. O. Halloran, American & British Mfg. Company, Providence, R. I.
Walter M. Saunders, chemist, Providence, R. I.
C. C. Boyden, Matthew Addy & Co., New York.
E. B. Pierce and R. P. Power, Wheeler Foundry Company, Worcester, Mass.
George B. Buckingham, Arcade Malleable Iron Company, Worcester, Mass.
Charles F. Butterworth, J. L. White Company, Pawtucket, R. I.
G. S. Bullock, Whitehead Bros. Company, Boston.
P. Pero, Pero Foundry, Worcester, Mass.
W. H. Bouse and A. W. Chase, Kinsley Iron & Machine Company, Canton, Mass.
James Morpeth, Brown & Sharpe Mfg. Company, Providence, R. I.
J. W. Conway, Hartford Foundry Company, Hartford, Conn.
J. G. Buckley, Hartford, Conn.
P. Shields, Shields Foundry Company, Mansfield, Mass.
F. B. Farnsworth, McLagon Foundry Company, New Haven, Conn.
A. Carpenter, A. Carpenter & Sons Company, Providence, R. I.
F. G. Scholfield, Kabley Foundry Company, Worcester, Mass.
William C. Doherty, Doherty Bros. Company, Lowell, Mass.
Henry D. Sharpe, Brown & Sharpe Mfg. Company, Providence, R. I.
Edgar W. Anthony, E. O. Burrows and W. C. Skulley, Smith & Anthony Company, Boston.
W. H. Coffin, Springfield Foundry Company, Springfield, Mass.
C. A. Reed, N. S. Bartlett & Co., Boston.
F. P. Leonard, Dighton Furnace Company, Dighton, Mass.
Fred. F. Stockwell and H. R Luther, Barbour, Stockwell Company, Cambridge, Mass
John Magee, Magee Furnace Company, Boston.
L. S. Brown, Springfield Foundry Company, Springfield, Mass.
W. H. Lucas, Walker & Pratt Mfg. Company, Boston.
W. F. Savage, Taunton Iron Works, Taunton, Mass.
R. D. Alger, Alger Iron & Foundry Company, East Bridgewater, Mass
E. H. Colvin and C. H. Colvin, Colvin Foundry Company, Providence, R. I.
L. S. Drake and George C. Belcher, L. S. Drake & Co., Easton, Mass.
Charles R. Earl, Phenix Iron Foundry, Providence, R. I.
I. M. Heilig, Boston.
J. F. Blauvelt, New England Butt Company, Providence, R. I.
C. C. Blaney and A. D. McLean, C. C. Blaney & Co., Boston.
C. Hitch, Jr., Henry F. Arnold and H. W. Woodworth, American Tool & Machine Company, Boston.
William J. Breen, of Hugh W. Adams, Boston.
E. J. Lyon, Brown & Sharpe Mfg. Company, Providence, R. I.
E. L. Le Baron, Le Baron Foundry Company, Middleboro, Mass.

The United Sheet & Tin Plate Company.

The following officers have been elected for the United Sheet & Tin Plate Company, recently organized with a capital of $1,000,000 to combine certain independent sheet and tin plate plants, steel mills and other properties, principally in Ohio: President, M. F. Strauss of Philadelphia; vice-president, J. R. Jackson of New York; secretary, Lakin C. Taylor of Cambridge, Ohio; treasurer and general manager, H. C. Strauss of Philadelphia. The directors, in addition to the officers, are H. B. Stewart of Canton, Ohio; C. L. Bailey of Marietta, Ohio; J. S. Black of Cambridge, Ohio, and W. H. Davis of Byesville, Ohio. Of the above, M. F. Strauss and H. C. Strauss are the president and general manager, respectively, of the American Tin & Terne Plate Company of Philadelphia; Mr. Jackson is president of the Jackson Rolling Mill Company of Easton, Pa.; Mr. Taylor is secretary of the Marietta Sheet & Tin Plate Company of Marietta, Ohio; Mr. Stewart is a director of the Canton Savings & Trust Company of Canton, Ohio; Mr. Davis is manager of the Wills Creek Coal Company and director of the First National Bank of Byesville, Ohio, and Mr. Black is an attorney of Cambridge, Ohio.

The plants merged in the new company include those of the Marietta Sheet & Tin Plate Company, Marietta, Ohio; the American Tin & Terne Plate Company of Philadelphia, a dipping concern of long standing; the Tuscora Steel Company, with sheet rolling mill and galvanizing plant at Newcomerstown, Ohio; the Cambridge-Byesville Steel Company, now building an open hearth steel plant with blooming and billet mills at Byesville, Ohio, and the Tucker Steel Roofing Company, Newark, Ohio. The company also own natural gas properties at Marietta and Byesville, as well as valuable coal properties.

The estimated annual output of the company will be 40,000 to 50,000 tons of billets, sheet and tin plate bars and structural steel, 30,000 tons of black sheets, plate and tin plate and galvanized iron, some of which product will be in the shape of corrugated iron conductor pipe, steel ceilings, &c. It is estimated that the output of the coal fields owned and controlled by this company will exceed 200,000 tons of coal, one-half of which will be utilized for manufacturing purposes and the balance will be marketed. The plants embraced in this consolidation are new and modern. The general offices of the company will be located at Pittsburgh, Pa., and Columbus, Ohio.

By the combination thus effected, the company will be able to control their raw material and fuel, giving them all the advantages that accrue from such favorable conditions. With their present facilities for manufacturing they expect to be able to operate their mills continuously, as the steel roofing, galvanizing and tinning plants will consume the greater proportion of their output.

British Iron and Steel and the Proposed Fiscal Tariff.

LONDON, August 8, 1903.—I propose briefly to set out the arguments which will probably be used by the advocates of a fiscal change, particularly as it affects the British iron and steel industries. What follows is in no way my own personal opinion, but will, I think, faithfully state the contentions of those who believe that a preferential tariff is of the very first importance to the welfare of this particular trade.

British Supremacy Gone.

In the manufacture of iron and steel Great Britain is no longer supreme. America and Germany have outpaced her. This is doubtless due to causes inherent in the nature of the case, but not absolutely so. Free trade has been a potent force in weakening the productive capacity of British works. Moderate protection has become a necessity. Even if we were to lose this trade almost entirely and replace it by some other more remunerative industry, the loss would be irreparable, because upon the efficiency of iron and steel production depends absolutely our powers of naval and military defense. Under modern conditions there can be no substitute for iron and steel, and if war is to be the final test of a nation's efficiency, it follows that apart from economic considerations, we must maintain intact our iron and steel industries. Adam Smith's dictum apparently still holds good, that defense is better than opulence. It is contended, however, that both on grounds of military expediency, imperial policy and economic resource, the case for a tariff is irresistible.

A glance back at all available historical data is necessary to fortify the case for protection. I accordingly append a series of tables showing the growth of the industry and its relation to the growth of similar American and German industries. These statistics are those used by the ablest advocate of the proposed change. The first table shows the growth of the British iron trade, from 1740 to 1872. It is pointed out that during most of that period the trade was protected. Free traders are asked if, by an inspection of these figures, they can tell by what stages and in what years the duties on imported iron were repealed. The contention is that the trade grew, assuming greater and greater dimensions, for reasons quite apart from free trade or protection. It follows that new and pertinent reasons must now be advanced for the imposition of any protective or preferential tariff. It is historically interesting to note that down to 1872 all the iron produced in England was produced from English ores. The increase of iron production during the past 30 years is, of course, due to the heavy importations of ore from Spain, Algiers and Sweden. The comparative exhaustion of British ores partly accounts for this, but an important factor is, of course, vastly improved and cheaper methods of transit. In this connection it is argued that while economically there can be no objection to the purchase of foreign ores, yet it has often happened in European history that raw materials have assumed diplomatic importance. Further, suppose Sweden or Spain were to develop their own national industries?

Pig Iron Produced in the United Kingdom, 1740-1872, in Gross Tons.

1740	7,000	1860	3,827,000
1760	15,000	1865	4,819,000
1780	40,000	1870	5,964,000
1800	158,000	1871	6,627,000
1820	400,000	1872	6,742,000
1840	1,396,000		

Pig Iron Produced in the United Kingdom.

	From British ore. Gross tons.	From foreign ore. Gross tons.
1887-90	4,967,000	2,978,000
1891-95	4,258,000	2,986,000
1896-1900	4,785,000	4,104,000

Iron Ore Imported, in Gross Tons.

1872-75	745,000	1886-90	3,741,000
1876-80	1,341,000	1891-95	3,978,000
1881-85	2,896,000	1896-1900	6,045,000

Iron Ore Produced in Germany, the United States and the United Kingdom.—Annual Average, in Gross Tons.

	Germany.	United States.	United Kingdom.
1886-90	10,182,000	15,277,000	14,023,000
1891-95	11,679,000	14,062,000	12,055,000
1896-1900	16,496,000	21,038,000	14,031,000
1881-90	9,369,000	.....	15,452,000
1891-1900	14,087,000	17,550,000	13,043,000

Production of Pig Iron in Germany, the United States and the United Kingdom.—Annual Average, in Gross Tons.

	Germany.	United States.	United Kingdom.
1866-70	1,245,000	1,461,000	5,132,000
1871-75	1,945,000	2,247,000	6,458,000
1876-80	2,176,000	2,562,000	6,657,000
1881-85	3,410,000	4,300,000	8,097,000
1886-90	4,214,000	7,078,000	7,759,000
1891-95	5,081,000	8,132,000	7,244,000
1896-1900	7,446,000	11,491,000	8,889,000
1881-90	3,812,000	5,689,000	7,928,000
1891-1900	6,263,000	9,811,000	8,067,000

Actual Decline Per Head of Population.

It is not necessarily a disaster to be outstripped in production by another country, whose population and natural resources exceed ours, but the situation becomes serious when an actual decline sets in—a decline in proportion to population. The advocates of a fiscal change contend that this is now the case; that not only has Great Britain ceased to be "self sufficient," but that her iron and steel industries are in process of what looks like actual decay. Notwithstanding the greatly increased importation of foreign ores, the production of pig iron shows a falling off from 210 tons per 1000 of population in the decennial period 1881-1890 to 200 tons in 1891-1900. In 1872 the production of pig iron was 300 tons per 1000 population. The next table goes to show that we are exporting less and importing more and get more unwrought and wrought iron and steel:

Iron and Steel, Unwrought and Wrought or Manufactured.—Annual Average, in Gross Tons.

	Imported.	Exported.
1876-80	203,500	2,708,800
1881-85	302,400	3,768,900
1886-90	381,300	3,937,100
1891-95	379,700	2,862,300
1896-1900	626,900	3,547,700
1881-90	341,800	3,853,000
1891-1900	503,300	3,205,000
1901	967,600	2,877,700

It is further contended that the same process is observable throughout the whole group of iron and steel trades. The following statistics indicate distinct retrogression, taken as a whole. Machinery sold to other countries shows an actual advance in value of 27 per cent., compared with ten years ago, but this becomes 17 per cent. if we allow for increase of population. Meanwhile imports show a progressive increase.

Iron and Steel Group, Including Iron and Steel Manufactures, Machinery, Implements and Tools, Electrical Apparatus, Hardware and Cutlery, &c.

	Imports.		Exports.	
Year.	Value in '000,000 £.	Per 1000 of population.	Value in '000,000 £.	Per 1000 of population.
1876-80	2.8	£82.5	32.7	£997.2
1881-85	3.8	107.3	42.9	1,206.5
1886-90	3.9	106.5	43.6	1,181.1
1891-95	4.1	107.9	39.8	1,033.2
1896-1900	9.0	222.6	48.3	1,195.6
1881-90	3.8	106.9	43.2	1,193.8
1891-1900	6.5	165.2	44	1,114.4
1901	13.8	334.3	46.2	1,113.0

Exports.—(Selected Branches).

Years.	Iron and steel. '000 £.	Implements, tools and machinery. '000 £.	Hardware and cutlery. '000 £.
1876-80	21,410	7,991	3,333
1881-85	26,797	12,644	3,547
1886-90	26,786	13,589	2,937
1891-95	21,321	15,049	2,092
1896-1900	26,233	18,400	2,098
1881-90	26,791	13,116	3,242
1891-1900	23,777	16,724	2,095
1901	25,282	17,752	2,076

Alleged Causes Examined.

It does not follow, of course, that free trade is the predisposing cause of this serious change in the current

of trade. Several reasons are adduced, and it is necessary to examine them. It is, for example, said that British manufacturers are hampered in competition by being compelled to pay relatively high wages. Wages in Great Britain are higher than in Germany, but lower than in America. It is contended, however, that wages have not materially risen in Great Britain in the iron trade of recent years. This is partially borne out by the Bowley averages:

Wages in British Iron Trade.

(Taking wages of agricultural laborers in 1891 = 100.

1840....144	1866.....164	1877.....182	1886.....180
1850.....142	1870.....170	1880.....176	1891.....187
1860.....150	1874.....193	1883.....187	

The argument as to wages does not carry us very far. It is those trades which pay high wages for efficient work that best survive the ordeal of foreign competition. But, if no general conclusion can be reached on this point, it is, at least, arguable that relatively high wages do not account for the decline of this trade.

Railroad freight rates is another cause assigned, and with very plausible evidence. There can be no doubt that adverse freight rates have seriously hampered British manufacturers; but it is pointed out that free traders are on the horns of a dilemma. They necessarily believe in free enterprise. If they are to control the railroads by means of Government machinery, they run counter to their own principles. If they object to Government control or possession and simply insist upon an all round reduction in freight rates, at the cost of the railroad stockholders, then they stand self condemned. They, in fact, ask for the protection of one industry at the expense of another. In any event, the advocates of fiscal change contend that there is no such marked difference in the working of British, American and German railroads as would justify the assumption that the British railroads are strangling the iron and steel trades.

A third cause assigned is defective technical and scientific education. Here all sides are agreed that both Germany and America surpass in their educational equipment. Even so, however, it is contended that there is far too much exaggeration in all this talk of technical education; that there has been an immense improvement in *personnel* during the past 30 years; that, man for man, the British workman is superior to the German and at least equal to the American; that it was not education that gave us the lead, and that it is not through lack of education we have lost it.

Thus it is seen that, however contributory these alleged causes may have been, they do not in themselves account for a marked decline in a great industry.

Dumping.

Passing from the symptoms of decay diagnosed by the free traders, I pass to those of the protectionists. Not the least of these is what we term "dumping." There are many business men who will tell you that they would be for free trade were it not that the system not only allows but actually encourages dumping. Let us see what the protectionists have to say as to the influence of dumping. They contend that it is thoroughly good business for the foreigner. They tell us that as Great Britain had a long start over America and Germany, both those countries are only too delighted to seize any and every opportunity to gain entrance for their products, even at a temporary loss. Old habits, established tradition, familiarity with the material—these, it is contended, keep the workman constant to British material. Then for some special reason dumping begins. At first the dumped product is regarded with suspicion; the workman is not familiar with all its constituent parts. But by slow degrees the foreign article or material wins its way. Prejudice is finally eliminated. Thus does the foreigner secure his foothold. It is held that this is only possible because the foreigner's home market is securely protected; that the British manufacturer would soon be bankrupt if he followed suit. Dumping is, we are told, carried on to a much greater extent than free traders admit. Generally, it is contended, dumping is a danger out of all proportion to the actual amount of our importations. The unsettling nature of its general market influence constitutes it a really serious element.

Tariffs and Trusts.

The case of the protectionist in regard to trusts is not very clear. Briefly this is the contention: The adoption of a moderate tariff, followed by a commercial treaty with America, would destroy the power of the trusts and tend to greater equality in prices as between the two countries. It is admitted that prices in England would temporarily rise, but that probably our exports of iron and steel would not further decline, while there would be increased productive activity to meet the demands of the home trade.

Disintegration of Local Unity.

A factor in the problem which cannot be proved by condensed statistics, but which is none the less real, is the tendency under free trade toward the disintegration of local unity. It is not easy to describe this in plain terms, but, by way of example, the case of South Staffordshire is cited. A generation ago South Staffordshire was a self contained iron center. You could pass from the mines to the furnaces, from the furnaces to factory and workshop, following the transformation of the raw material through every process into the finished product—implements, edge tools, machinery, hardware and so forth. Within a comparatively small area everything lay to hand, coal and iron, while taking the district as a unit, it represented a complete group of trades, constituting a little world, knit together by railroads and canals. In some ways the district is more prosperous now than then, but the old organization fabric has completely changed. This, in itself, may not be serious, but it carries in its train one unhappy result. It is impossible to change rapidly the transport system of a district to suit quick changing needs. In consequence, great areas, fomerly the scenes of active industry, are now dreary wastes. The connecting link in economic development is broken by the influence of free trade. The ores must come from over sea, processes change their locality, and the old district remains but the home of sweated and dying crafts. It is further contended that by free trade branches in the iron trade of the utmost importance are seriously injured or entirely displaced, however good the commercial organization and efficient the labor.

The Need for Imperial Self Containment.

The foregoing facts and considerations lead up to the general argument in favor of a preferential tariff. It is contended that as we are now relaxing our grip upon the world's neutral markets, it is increasingly imperative to tighten our grip upon our colonial markets. It is assumed that our self governing colonies will gladly cooperate. What, then, is the position? The British Empire is likened to the separate parts of a great machine, some highly finished, others but begun, all lying about among the *débris* of the workshop. We must complete them, fit them together, and clear away the rubbish which makes it so difficult to carry on the work of construction. When the process is compelted it is contended that we shall have an instrument which can be used to benefit mankind. We must frankly recognize that the natural tendency is to make Great Britain the home of highly specialized industries. We must deprive this process of its dangers, which strike at the permanence of British industry and so at British power. The next great step is to regain for the British Empire that self containment which England, as a country, has lost for all time.

Commercial Treaties

It does not follow that by achieving the self containment of the Empire we lose our present foreign trade. Advocates of the tariff claim that we can gain much by means of commercial treaties. As things are now, we cannot negotiate commercial treaties, because we have nothing to offer. Our markets are open to all. If we could negotiate on behalf of our colonies as well as in our own behalf, it is thought that many good bargains could be struck by means of commercial treaties. In this connection everything depends on the self governing colonies. Are they prepared to merge their identity, in some degree, into that of the Empire, for strictly imperial purposes? Upon an answer in the affirmative to this question depends the possibility of really valuable commercial treaties.

S. G. H.

MANUFACTURING.

Iron and Steel.

The Raney & Berger Furnace, erected at New Castle, Pa., in 1872, and now known as Shenango No. 3 of the Carnegie Steel Company, is being torn down to make way for a new 600-ton furnace now being erected by the company. When erected in 1872 it had a capacity of 75 tons a day and was regarded as one of the largest furnaces in the country. It was later increased by enlargements and improvements and was made a double stack plant. For several years it has been about the only relic of old-time iron making around New Castle.

A site has been selected by the Cherry Valley Iron Company of Sharon, Pa., for an additional furnace at West Middlesex. The new furnace will be 70 feet high and 20 feet in diameter and will cost about $500,000. The plant will be completed in November. It is expected that it will have a daily capacity of 250 tons.

The new 10-inch continuous mill of the American Steel Hoop Company, at Youngstown, Ohio, is expected to be placed in operation this week.

The South Sharon mills of the Carnegie Steel Company, South Sharon, Pa., embracing open hearth steel plant, rod, wire and wire nail mills, which have been idle for some weeks, are expected to resume operations on Monday, August 31. The blast furnace at this plant, which is to be relined, will not be ready for blast until about September 15.

The Haselton works of the Republic Iron & Steel Company, at Youngstown, Ohio, which have been idle for some time, are expected to start up either this or next week.

The Singer Nimick works of the Crucible Steel Company of America, at Pittsburgh, which have been closed since August 1, will remain idle until October 1, notice to this effect having been posted at the works.

The Central Iron & Steel Company of Harrisburg, Pa., will shortly resume operation of the 89-inch steel mill which was partially destroyed by fire several months ago. A temporary frame building is being erected over the machinery.

The Black Diamond Mfg. Company of Monongahela City have been chartered with a capital stock of $15,000, to manufacture in iron and steel. The directors are T. R. Campbell, M. F. Allen and T. M. Bogga.

Orders have been issued from the offices of the Eastern Steel Company of Pottsville, Pa., to push the work on the new plants of the company as rapidly as possible in order that steel may be made at the earliest possible moment. An increased force of men was put to work this week on the construction.

The Clinton Wire Cloth Company are to erect this season a building for electric welding and storage. The structure will be 135 x 150 feet and three stories high. In addition a new power plant will be built and equipped. Charles Swinscoe, who has been the manager of the company's business for over 22 years, has retired and his office has been abolished. John D. Mistroon will have full charge of the company's manufacturing interests, and C. F. Fairbanks, Jr., son of the treasurer of the corporation, is made the selling agent. Mr. Swinscoe will remain with the company for the present as consulting engineer.

A successful test was made this week at the works of the Glasgow Iron Company, Pottstown, Pa., of the patented gravity puddling machine invented by James Price, superintendent of the Glasgow works. A heat of 3500 pounds was puddled in 40 minutes by two men. By the old method only about 1000 pounds of metal can be made by four men in three hours. The quality is said to be superior to that of Norway iron.

The Sweets Steel Company, recently chartered at Harrisburg, Pa., have been reorganized under Pennsylvania laws with these officers: E. S. Burdick, president; H. L. Stevens, vice-president; C. H. Knapp, secretary and treasurer, and J. W. Maxwell, general manager. A new plant will be established on the site of the old Dodge Mills, at Williamsport, Pa., with connections with both the Pennsylvania and Philadelphia & Reading railroads. The contracts for the construction of several steel buildings will be let as soon as specifications are completed. The company expect to take to Williamsport about 300 men from Syracuse, N. Y., where they are now located.

The blast furnace of the Struthers Furnace Company, at Struthers, Ohio, turned out in July 10,085 tons of basic iron, an average in 31 days of 325 tons. The largest output in one week was 2082 tons. S. A. Richards is manager of this furnace.

The American Spiral Spring & Mfg. Company of Pittsburgh, have applied for a charter. They propose to build a plant in the Pittsburgh district for the manufacture of spiral springs and other steel specialties.

The Coxey Steel & Silica Sand Company, Mount Vernon, Ohio, have received a contract for the steel castings for 15 large gun carriages to be built by the Morgan Engineering Company of Alliance, Ohio. They have also received contract for the castings for four 24-foot steel racks for soaking pit furnaces for the open hearth plant of the Lackawanna Iron & Steel Company, at Buffalo, N. Y.

The blast furnace of the Carnegie Steel Company, at South Sharon, Pa., is being relined and repaired and is expected to be ready for blast about October 1.

The Bessemer plant of the Republic Iron & Steel Company, at Youngstown, Ohio, which has been idle since July 3, was put in operation on Monday, August 17. During the time the plant was idle a new blooming mill was installed in the place of the old mill. The two 5-ton converters have been taken out and two 10-ton vessels installed in their place. This plant is now expected to turn out from 1200 to 1500 tons of steel per day, and the new rolling equipment is to be amply able to take care of the output of the melting department.

No. 2 stack of the Carnegie Steel Company, at the Ohio Works, Youngstown, Ohio, was blown out on Monday, August 17, for relining and repairs. The stack will be idle two months or longer. Work on stack No. 4, at this plant, which is a new furnace, is progressing favorably and it is expected to be ready for operation about January 1 next.

The Pennsylvania Steel Company will rebuild their No. 3 blast furnace at Steelton, Pa., during the coming autumn. The stack has a capacity of 200 tons a day and when rebuilt will be able to produce 400 tons every 24 hours. The new furnace will be 84 feet high and will be a duplicate of No. 4 furnace. The present stack was built in 1883. At present the company have five furnaces in commission and are making 1000 tons of metal daily, which is the greatest amount ever produced by the Steelton furnaes. This week the company pay roll was increased to $8600, the largest in their history. The company are enjoying a very busy year at Steelton.

The first of three new open hearth furnaces of the Harrisburg Pipe & Pipe Bending Works, at Harrisburg, Pa., was put in operation on Monday, August 10. The steel made was the first ever cast in Harrisburg. A Hughes mechanical generator supplies gas to the furnaces. When the plant is finished there will be three basic furnaces of 40 tons capacity each, which will be fired about every ten hours. Previously the pipe company purchased their steel from outside concerns.

General Machinery.

The Rowbottom Machine Company of Waterbury, Conn., advise us that they are going ahead with their new brick addition, 40 x 120 feet, and are in market for a planer, lathe, radial drill of fair size, and a few small tools.

The Ray Automatic Machine Company announce their removal from Cleveland to Berea, Ohio, where they have just erected a large new plant. By moving into the new quarters the company are enabled to increase their production considerably. The Berea plant, which is located on the outskirts of Cleveland, has excellent transportation facilities.

The Goyne Steam Pump Company of Ashland, Schuylkill County, Pa., have been chartered with a capital of $10,000, to manufacture pumps and general machinery. The directors are C. A. Goyne, F. H. Goyne, J. R. Goyne and A. H. Goyne.

The Pittsburgh Pipe & Equipment Company of Pittsburgh have completed the erection of their works and are now in position to take care of machine shop work in general and also pipe fitting. They have installed machinery capable of bending wrought iron pipe up to and including 30 inches in diameter.

The drafting department of the Lloyd Booth plant of the United Engineering & Foundry Company, Youngstown, Ohio, will be discontinued September 1 and moved to the offices in Pittsburgh. After that date all work in connection with the Youngstown plant will be handled in the general offices of the United Engineering & Foundry Company in the Frick Building, Pittsburgh.

The Hunt Foundry & Machine Company of New Kensington, Pa., have made a voluntary assignment in the Westmoreland County courts at Greensburg. The assets of the concern are placed at $72,380 and the liabilities at $25,572.

The Latrobe Specialty Mfg. Company of Latrobe, Pa., have been incorporated to manufacture and sell the Donaldson patent metal working tool and other mechanical devices. The capital is $25,000 and the directors N. O. Fisher, G. T. Piles, M. J. Hines, Leon Gerst, H. L. Brindle, C. M. Williams and A. W. Lyda.

The National Drill & Machine Company of Barberton, Ohio, manufacturers of well drilling machinery, contractors' tools and grading machinery, are planning to erect a new building which will about double the capacity of their plant.

The National Gear Company, Ravenna, Ohio, will shortly open their new factory building. They are installing four large forges, a large planer, a cold tire setting machine and other new equipment.

The Loomis Machine Company of Tiffin, Ohio, manufacturers of oil well drilling machinery, are enjoying unprecedented demand for their product. They are shipping oil well machinery to Mississippi, Indiana, Kansas and Manitoba, as well as to a number of points in Ohio. They are planning to increase their facilities.

The Miller Machine Company of Norwalk, Ohio, have been incorporated in Delaware with $20,000 capital stock by George H. Miller, James B. Miller, H. F. Jackson, N. D. Miller and Arthur E. Rowley, all of Norwalk. They will manufacture anchors and chains for telephone and telegraph line construction.

The Geometric Drill Company of New Haven, Conn., contem-

plate enlarging their plant by the erection of a brick building 30 x 200 feet, two stories and a basement. The new building will replace a much smaller wooden structure now occupied as a pattern shop and power plant, and will be devoted to general manufacturing purposes. It will connect the present shop building and the office building. The additional manufacturing space is much needed by the company.

Power Plant Equipment.

The Columbus Heating Company of Columbus, Ohio, who hold a franchise to build a steam heating system in that city, have purchased a site and are placing contracts for piping the leading streets of the city. The steam power plant will cost $300,000, and it is probable that an electric lighting plant will be installed in connection with the heating system. Douglas Deahl, Ewing Jones and D. E. Nearmer of New York, and James M. Carew of Detroit are promoting the company.

D. R. P. Dimick of Birmingham, Ala., has been awarded a contract for the erection of a water works system for the village of Milford, Ohio. A Stillwell-Bierce & Smith-Vaile pump of 750,000 gallons capacity per day will be installed. A standpipe made of concrete and costing $3250 will be erected in connection with the water works system.

Among the sales of Reynolds Corliss engines made during the month of July by the Allis-Chalmers Company of Chicago were: Consumers' Heat & Electric Company, Bloomington, Ill., one 20-inch and 32 x 36 inch heavy duty cross compound; Union Sugar Company, San Francisco, Cal., one 18 x 36 inch girder frame; Canton Oil Mill Company, Canton, Miss., one 16 x 42 inch girder frame; Henry Du Pont, Wilmington, Del., one 20 x 42 inch girder frame; Olds Motor Works, Lansing, Mich., one 16 x 42 inch girder frame; the Clayton Oil Mills, Clayton, N. C., one 18 x 42 inch girder frame; Charles B. Pride, Appleton, Wis., one 18 x 36 heavy duty; Columbus, Buckeye Lake & Newark Traction Company, Columbus, Ohio., one 34-inch and 68 x 48 inch vertical cross compound condensing heavy duty; Lock, Moore & Co., Limited, Westlake, La., one 24 x 48 inch heavy duty; Georgia Cordage Mills, Decatur, Ga., one 16 x 42 heavy duty; Marquette Cement Mfg. Company, La Salle, Ill., one 20 x 42 inch heavy duty; C. A. Macdonald, Chicago, one 16 x 36 inch girder frame; Arkansas City Milling Company, Arkansas City, Kan., one 22 x 42 inch heavy duty; Manhattan Rubber Mfg. Company, Passaic, N. J., one 24-inch and 40 x 42 inch heavy duty tandem compound; the Gauley Company, Camden-on-Gauley, W. Va., one 16 x 36 inch heavy duty; Rock Hill Water, Light & Power Company, Scranton, Pa., one 20 x 42 inch girder frame; Memphis Consolidated Gas & Electric Company, Memphis, Tenn., one 27-72 x 48 inch horizontal cross compound heavy duty direct connected; Knox Construction Company, Chicago, two 20-inch and 40 x 48 inch heavy duty cross compound direct connected; Richmond Cedar Works, Richmond, Va., one 24-inch and 36 x 48 inch heavy duty cross compound; Barrett Mfg. Company, Beloit, Wis., one 20-inch and 40 x 48 inch heavy duty cross compound; American Aristotype Company, Jamestown, N. Y., one 18 x 36 inch girder frame; Stilwell-Bierce & Smith-Vaile Company, Dayton, Ohio, one 16 x 42 inch girder frame; Fourche River Lumber Company, Chicago, one 24 x 48 inch heavy duty, one 20 x 42 inch heavy duty. Sales of other power plant equipment include: J. I. Case Plow Works, Racine, Wis., one Reynolds air pump and jet condenser; Charles Waite, South Dakota, one 12 x 30 inch girder frame Reynolds Corliss engine, two 70 horse-power 54 x 16 inch tubular boilers, one No. 5 feed water heater; the Homestake Mining Company, Lead, S. D., one 18-32-34-34 x 42 inch combined horizontal vertical triple expansion engine, three 320 horse-power Sederholm boilers; Lacey-Buek Iron Company, Birmingham, Ala., one 44-inch and 84 x 60 inch vertical standard furnace blowing engine.

Foundries.

A ventilating system, including fans and motors, is about the only equipment required by the Frank C. Patten Company of Sycamore, Ill., for their new foundry. The building will be 70 x 206 feet, with cupola room 24 x 50 feet. The company have two other foundries, and when this new one is completed the capacity will be more than double.

The Butler Foundry & Machine Company, who were recently organized, will begin at once the erection of a large plant at North Butler, a manufacturing suburb being laid out adjacent to Butler, Pa. Contracts for a portion of the machinery have been placed. J. C. Reed of Pittsburgh is the president of the company.

W. A. Case & Son of Buffalo, N. Y., manufacturers of steam fitters' and plumbers' supplies and brass, copper and iron work, have purchased from the Jewett Stove Company a large five-story factory building, with foundry adjoining, on Mississippi street, having 486 feet street frontage and a like frontage on the canal, and equipped same for their general manufacturing plant and the brass, copper and iron departments. They have also rebuilt the plant on Washington street, burned some months since, with a five-story building for the pipe and steam fitting department, and have rebuilt and fitted up their building fronting on Main street with offices and salesrooms which are complete and up to date in every particular. On the ground floor of this building are located the large general offices of the company and the private offices of the president, secretary and treasurer, the three stories above being devoted to show rooms for the exhibition of the company's products. A restaurant has also been provided for the use of the employees of the general offices.

The plant of the Keystone Foundry Company, at Uniontown, Pa., has been closed by the sheriff on an execution by M. Streng Sons, Limited, of Pittsburgh, for over $7000.

The Bethlehem Steel Company have shipped on one car to the Homestead Steel Works at Munhall, Pa., a casting weighing 170,000 pounds. It was aboard a car 103 feet in length and was shipped as a special train.

The directors of the Emmert Mfg. Company of Waynesboro, Pa., have authorized the immediate construction of a foundry building 40 x 80 feet in dimensions. The company's business has continued to increase, the latest foreign order being for 16 vises from England.

The Lehighton Foundry & Machine Works, at Lehighton, Pa., were sold last week at sheriff's sale on an execution of the First National Bank of Lehighton, for $6000. The company manufactured heating furnaces and radiators.

Bridges and Buildings.

The National Wire Corporation of New Haven, Conn., have put in the foundation for a large clearing house. Work on No. 2 wire mill is being rushed day and night and the expectation is that it will be started up within two weeks. The company are much in need of the product of this mill, for business is rushing.

One of the largest shipments in many months was made last week by the bridge shop of the Pennsylvania Steel Company of Steelton, when four bridge girders of 48 tons each were shipped to the New York, New Haven & Hartford Railroad at Bridgeport, Conn., where a large viaduct is being built by that company. The girders were of such an unusual size that the steel company had specially constructed cars for their transportation. The cars are 3 feet 6 inches from the ground and when loaded the girders are 14 feet 6 inches from the rail. Twelve cars were necessary to carry the big bridge material. The girders are each 87 feet 10½ inches long, 10 feet 10 inches deep and have a total weight of 192 tons. Two and one-half cars are needed for each girder and the outfit is a train in itself.

Fires.

The White-Warner Company of Taunton, Mass., whose plant was recently destroyed by fire, have bought the plant of the Taunton Iron Works. The White-Warner Company will manufacture the lines of the Taunton Iron Works as well as its own lines. The plant was started up this week. The Taunton Iron Works was established in 1857 and is one of the oldest stove concerns in the country.

The storehouse of the Clifton Mfg. Company, on Sayre street, Buffalo, was destroyed by fire with contents on the 14th inst.

The recent fire at the plant of the Keyser Mfg. Company of Chattanooga, Tenn., did not damage the manufacturing part of the plant, the warehouse and the office building being the only parts destroyed.

Hardware.

Norton-Edgar Can Company, Ludlow, Ky., have been incorporated under the laws of Kentucky with a capital of $100,000 to manufacture cans and metal specialties and machinery and dies for the same. The officers of the company are H. M. Norton, president; M. W. Edgar, vice-president and secretary, and J. J. Moser, treasurer. The company have taken a lease of the premises formerly occupied by the American Can Company in Ludlow, the building being equipped with power plant, steam heat and electric light. They have put in a small machine shop, which is now in operation. The company intend for a time at least to manufacture paint, color and varnish cans exclusively. Their order for can making machinery was placed with Stiles-Morse Company of Chicago, who are Western agents for E. W. Bliss Company of Brooklyn, N. Y. A good part of it is promised for shipment within a month. The company will get into operation as early as possible, and have assurances of a goodly amount of business as soon as they are ready to take care of it.

Keystone Farm Machine Company, York, Pa., manufacturers of corn shellers, weeders, cultivators, harrows, &c., have had plans made for a three-story addition to their factory. It will be 100 x 170 feet and of slow burning construction. The building will be used for storage purposes.

The Cleveland Hardware Company of Cleveland have leased the factory on Hamilton street, formerly ocupied by the Horix Mfg. Company, and are installing punches and presses with a view to utilizing it in the production of certain parts in their line of carriage and wagon specialties. It was only recently that they erected a large addition to their plant.

The Crafton Hardware Company of Crafton, Pa., have been chartered with a capital of $10,000 and these directors: L. M. Hoffman, Charles Denny and A. M. Branen.

Miscellaneous.

The Atlas Car & Mfg. Company of Cleveland have recently completed the erection of new structural shops, which greatly increases their facilities for turning out cars. They are at work on 200 small steel cars to be shipped to the Philippines.

Albert L. Colburn, rivet and washer manufacturer, at New Haven, Conn., has taken larger quarters at 20 Artisan street, in that city.

The Iron and Metal Trades.

Undue importance has been attached to the announcement that the associated Southern furnace companies have reduced the price of No. 2 Foundry from $13.50 to $12, Birmingham. As in previous reductions in the official price, the associated furnacemen have again merely recognized the settling of the market on the part of the independent producers. For some weeks quotations on Southern Foundry Iron have been based on a $12 rate. The official reduction can therefore hardly be characterized as a cut. The action thus taken, however, has some significance in showing that the associated producers recognize that Iron cannot be marketed above $12, Birmingham. It remains to be seen whether the official price now named can be maintained, or whether it will be further reduced. The volume of business has certainly increased heavily of late, but some of it has been placed under the rate now named by the associated furnacemen. The Chicago market has been particularly active. It is stated that the International Harvester Company have purchased fully 100,000 tons in the past two weeks, of which 75,000 tons were Northern and 25,000 tons Southern, and are still in the market. Sales of Malleable Iron at Chicago thus far during the month are placed at 100,000 tons, and Basic Iron is in greater demand, with negotiations pending on 15,000 to 20,000 tons. The smaller Western consumers are also buying more freely. Cincinnati and St. Louis report increased business. Eastern markets are likewise fairly active, but Pittsburgh reports quiet conditions in Pig Iron.

The International Harvester Company have purchased 40,000 tons of Soft Steel Bars and 11,000 tons of Light Sheets for delivery in 1903-4. The placing of this business has been deferred for a long time, and its consummation now is likely to influence other buyers in the same lines.

Officials of the United States Steel Corporation take a hopeful view of the situation. They state that the subsidiary companies now have as large a tonnage on their books as at the corresponding time last year. The condition of the Tube, Tin Plate and Wire trades is especially good. The National Tube Company were never so crowded with work as at present. The closing of some departments at the Homestead works of the Carnegie Steel Company is due to the pressing necessity for repairs, as these departments have been operated to their utmost for more than two years. The Sheet trade has for some time been less active, but it is stated that no more Sheet mills are now idle than usual at this season in ordinary years. The Structural trade is lighter than during the spring months, mainly on account of strikes in the building trades. The corporation is not negotiating for Bessemer Pig Iron, and no purchases will be made for some time.

Car shortage is beginning to be felt in various sections of the country, particularly in the West and South, and fears are expressed that last fall's experience may be repeated to some extent.

A transaction of more than ordinary interest has occurred in Ferro Silicon. A sale of about 150 tons of 50 per cent. Ferro Silicon has been made, for delivery at an interior point at a price somewhat under $103 per gross ton delivered. The metal comes from Continental Europe. This is the largest sale ever made of this class of material.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	Aug.19, 1903.	Aug.12, 1903.	July22, 1903.	Aug. 20, 1902.
PIG IRON:				
Foundry Pig No. 2, Standard, Philadelphia	*$16.75*	$16.75	$17.75	$22.00
Foundry Pig No. 2, Southern, Cincinnati	*15.25*	15.25	15.75	20.25
Foundry Pig No. 2, Local, Chicago	*16.50*	17.25	17.25	22.00
Bessemer Pig, Pittsburgh	*17.85*	18.85	18.75	21.50
Gray Forge, Pittsburgh	*16.00*	16.00	17.50	20.75
Lake Superior Charcoal, Chicago	*21.00*	21.00	21.50	26.00
BILLETS, RAILS, &c.:				
Steel Billets, Pittsburgh	27.00	27.00	27.00	31.00
Steel Billets, Philadelphia	28.00	28.00	28.25	28.50
Steel Billets, Chicago	28.00	28.00	28.00	31.00
Wire Rods, Pittsburgh	*35.00*	35.00	35.50	36.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL:				
O. Steel Rails, Chicago	*16.50*	16.50	17.00	18.50
O. Steel Rails, Philadelphia	*17.75*	18.00	18.75	21.50
O. Iron Rails, Chicago	*18.50*	18.50	20.00	24.50
O. Iron Rails, Philadelphia	*21.00*	19.50	21.50	24.00
O. Car Wheels, Chicago	21.50	21.50	21.50	21.00
O. Car Wheels, Philadelphia	*19.00*	19.00	21.50	20.00
Heavy Steel Scrap, Pittsburgh	*19.00*	19.00	19.50	....
Heavy Steel Scrap, Chicago	*15.00*	15.00	16.50	18.00
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	*1.60*	1.55	1.65	1.92
Common Iron Bars, Chicago	*1.60*	1.60	1.65	1.80
Common Iron Bars, Pittsburgh	*1.60*	1.60	1.70	1.80
Steel Bars, Tidewater	1.70	1.70	1.70	2.00
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.75
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.75
Beams, Tidewater	1.73½	1.73½	1.73½	2.25
Beams, Pittsburgh	1.60	1.60	1.60	2.00
Angles, Tidewater	1.73½	1.73½	1.73½	2.35
Angles, Pittsburgh	1.60	1.60	1.60	2.00
Skelp, Grooved Iron, Pittsburgh	*1.82½*	1.82½	1.85	2.15
Skelp, Sheared Iron, Pittsburgh	*1.87½*	1.90	1.90	...
Sheets, No. 27, Pittsburgh	*2.60*	2.60	2.65	2.90
Barb Wire, f.o.b. Pittsburgh	2.60	2.60	2.60	2.90
Wire Nails, f.o.b. Pittsburgh	2.00	2.00	2.00	2.05
Cut Nails, f.o.b. Pittsburgh	2.15	2.15	2.15	2.05
METALS:				
Copper, New York	**13.62½**	13.00	13.50	11.50
Spelter, St. Louis	5.50	5.45	5.50	5.20
Lead, New York	4.12½	4.12½	4.12½	4.10
Lead, St. Louis	*4.10*	4.05	4.12½	3.97½
Tin, New York	**27.80**	28.25	27.25	28.30
Antimony, Hallett, New York	*6.37½*	6.50	6.50	8.00
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	3.99	3.99	3.99	4.19

Chicago.

FISHER BUILDING, August 19, 1903.—(*By Telegraph.*)

There has been further liberal buying of Pig Iron, and while individual transactions have been smaller than for several weeks past aggregate tonnage has been considerable and is really more satisfactory to producers, as it indicates a more healthful condition, small consumers largely covering their requirements, and the indication is for continued activity, although at the expense of prices. The Southern associated furnaces reduced the official price of No. 2 Foundry to $12, Birmingham, on Monday last, but the actual market had already passed that point on its downward course. One interesting point has been the unusual strength of Northern Iron, it being held fully $1 a ton above the level of Southern Iron; but Northern Iron naturally sympathizes with the Southern output to some extent, at least. Further liberal sales of Malleable Iron have been made, and there has been more buying of Softeners, both of Northern and Southern production. Bar Iron has sold a little more readily, but in small lots, without change in mill prices; but the merchant trade has met with keener competition and has reduced prices for carload shipments. There has been very little activity in Steel, and the most important new feature developed is the attention being paid to export trade, both mills and warehousemen, it being reported, having taken considerable business within the past week or two for foreign shipments. Actual transactions in Structural Shapes have been small, but there is some railroad business of importance pending. The competition among the merchant trade has been keener recently, and although there is a fair volume of business, prices have been reduced for shipment from local store

Black Sheets have continued easy, and some cutting in prices is indulged in. Galvanized Sheets have developed a firmer tone, with less free offerings at the close. There has been only a moderate movement in Billets, Rails and Track Supplies, Plates and Merchant Steel, without essential change in prices. Merchant Pipe has continued very active, while Cast Iron Pipe has been dull, with the tendency toward lower prices. There has been a moderate movement in Coke at prices previously quoted. Old Material continues to sag, in sympathy with Pig Iron, with the mills and furnaces buying only from hand to mouth. Implement manufacturers, who have been such prominent factors in the market for both Iron and Steel recently and have made heavy purchases, are about to buy from 3000 to 4000 tons of Skelp; contracts will doubtless be closed this week.

Pig Iron.—The Southern associated furnaces on Monday, August 17, reduced their official price of No. 2 Foundry to $12, Birmingham, thus once more bringing the official close to the actual market, as most of the sales of Southern Iron during the last week have been made on the basis of $12 for No. 2, Birmingham; but in anticipation of the move of the association sales of several hundred ton lots were made by independent furnaces on Monday at $11.75, and since that time at $11.50, for No. 2, Birmingham. There has been considerable activity throughout the week both in Northern and Southern Irons. The fact that Northern producers have been able to sell a large tonnage of Foundry Iron at about $1 per ton over the equivalent price for Southern Coke Iron has created no little comment and seems likely to turn consumption more upon the Southern product wherever possible, this discrepancy now between the two kinds of Iron being too great, except where it is absolutely necessary to have Northern Iron for the purposes of mixture. As a rule, however, Northern furnaces are in a stronger position than Southern producers, having made large sales for long deliveries. No very large single orders have been placed during the last week, but the total tonnage has been large, aggregating upward of 50,000 tons, made up of various grades, deliveries being mainly for the last half of the year. The purchases of the International Harvester Company prove to have been larger than previously recorded, the aggregate now being estimated at 100,000 tons, there being one lot of 25,000 tons and one lot of 50,000 tons of No. 2 Northern Iron, at about $17, delivered, shipments extending into March of 1904. It is estimated also that this interest purchased 25,000 tons of Southern Iron at about $12 for No. 2, Birmingham, and are still in the market for additional amounts of Southern Coke Iron, but have reduced their bidding price from 50c. to $1 per ton. The sales of Malleable Iron thus far during the month are estimated at 100,000 tons, most of which sales have already been reported. The largest transactions were on the basis of $17.50, Chicago. There has also been an improved demand for Basic Iron, with sales of from 2000 to 4000 tons on the basis of $12.25, Birmingham, for delivery during the third quarter of the year, and negotiations are pending on lots of from 15,000 to 20,000 tons at a lower level for delivery during the last half of the year. Among the sales during the week have been No. 2 Northern Iron in lots of from 100 to 2000 tons at $17 to $17.50, Chicago, but at the close it would be difficult to sell large quantities over $16.50. Southern Iron has been sold in 100 to 500 ton lots, with exceptional transactions of 1000 tons, mainly on the basis of $12 for No. 2 Foundry and No. 2 Soft, Birmingham, but at the close 300 tons sold at $11.75 and larger lots at $11.50, Birmingham, basis. One lot of 3000 tons and one lot of 5000 tons of Malleable Bessemer have sold at $17, Chicago, and Standard Bessemer is difficult to sell over $18. Jackson County and Kentucky Silvery Iron has sold in a few hundred ton lots on the basis of $18 to $20, at the furnace, for 6 to 10 per cent. The fact that small consumers are now in the market in force is evidence that the long delayed buying movement is in progress, but the fact that Southern producers have surrendered has a tendency to take off the keen edge of the buying movement. The following are the approximate prices current, f.o.b. cars, Chicago, the outside prices being for small quantities and the inside prices for round lots for long delivery:

Lake Superior Charcoal	$21.00 to $22.00
Northern Coke Foundry, No. 1	17.00 to 17.50
Northern Coke Foundry, No. 2	16.50 to 17.00
Northern Coke Foundry, No. 3	16.00 to 16.50
Local Scotch, No. 1	18.00 to 18.50
Ohio Strong Softeners, No. 1	18.00 to 18.50
Ohio Strong Softeners, No. 2	17.50 to 18.00
Southern Silvery, according to Silicon	18.10 to 19.00
Southern Coke, No. 1	16.35 to 16.85
Southern Coke, No. 2	15.85 to 16.35
Southern Coke, No. 3	15.35 to 15.85
Southern Coke, No. 1 Soft	16.35 to 16.85
Southern Coke, No. 2 Soft	15.85 to 16.35
Foundry Forge	14.85 to 15.35
Southern Gray Forge	14.35 to 14.85
Southern Mottled	13.85 to 14.35
Southern Charcoal Softeners, according to Silicon	19.30 to 21.30
Alabama and Georgia Car Wheel	25.35 to 27.35
Malleable Bessemer	17.35 to 18.00
Standard Bessemer	17.75 to 18.25
Jackson County and Kentucky Silvery, 6 to 10 per cent. Silicon	20.30 to 22.30

Bars.—While the week under review has been very quiet, with sales of Soft Steel Bars confined to small quantities, the largest individual transaction being for 1000 tons for extended delivery, the announcement that the International Harvester Company have purchased 40,000 tons for delivery during 1903-1904 has created some interest. Official prices are unchanged, but a few independent mills are shading the established prices slightly. There has been an improved demand for small quantities for Bar Iron, sales being made mainly at 1.65c., Chicago, but round lots for long delivery could be purchased at 1.60c. A great many inquiries are being received which have not yet led to business, but a general buying movement is anticipated early in September. With the exception of Bar Iron the following are the official prices, f.o.b. cars, Chicago, mill shipment: Bar Iron, 1.60c. to 1.65c.; Soft Steel Bars, 1.76½c. to 1.86½c.; Hoops, 2.06½c. to 2.16½c.; Bessemer Bands, 1.76½c. to 1.86½c.; Angles, under 3 inches, 1.86½c. to 1.91½c., base. There has been little increase in the merchant trade and the market has continued steady, except for Iron Bars, which are now selling at 1.90c. in carload lots and 2c. to 2.15c. in less than carload lots. Soft Steel Bars, 2c. rates; Angles, under 3 inches, 2.10c. rates, and Hoops, 2.40c., base, from store.

Structural Material.—Transactions during the past week have been light. Even specifications on old contracts have been slow, but there is some business which is being figured upon by Steel mills and local contractors, both in Chicago and in other sections, aggregating a fair tonnage. Among the more important is Steel for the construction of the Pennsylvania depot at Washington, D. C., and several railroad bridges in the Northwest and West. Little difficulty is now experienced in getting prompt deliveries from the mills on almost any size, but the market remains steady as previously quoted, as follows: Beams, Channels and Zees, 15 inches and under, 1.75c. to 1.90c.; 18 inches and over, 1.85c. to 2c.; Angles, 1.75c. to 1.90c. rates; Tees, 1.80c. to 1.90c.; Universal Plates, 2c. to 2.25c. There has been some little improvement in the demand for shipment from local stocks, but increased competition has resulted in lower prices, sales being made as follows: Beams and Channels, 2.10c. to 2.25c.; Angles, 2.10c. to 2.25c.; Tees, 2.15c. to 2.30c., from local yards.

Plates.—The new business offering is very light, and even the specifications on old contracts are none too plentiful. However, the market is well sustained, official prices being as follows, f.o.b. Chicago: Tank Steel, ¼ inch and heavier, 1.75c. to 2c.; Flange, 1.85c. to 2.15c.; Marine, 1.95c. to 2.10c. There has been a moderate movement only from local warehouses, but prices have been maintained, as follows: Steel, ¼-inch and heavier, 2.15c. to 2.20c.; Tank Steel, 3-16-inch, 2.25c. to 2.30c.; No. 8, 2.30c. to 2.40c.; Flange Steel, 2.40c. to 2.50c., all f.o.b. warehouse, Chicago.

Sheets.—The only large recent transaction is for 11,000 tons purchased by the International Harvester Company from the largest interest in the market, reports being current that the agricultural interests have succeeded in obtaining substantial concessions from the official list. Independent mills are making a more active canvass for business, resulting in lower prices in some instances. The following are the official prices asked, f.o.b. cars, Chicago, mill shipment: No. 10, 2.06½c. to 2.16½c.; No. 12, 2.16½c. to 2.26½c.; No. 14, 2.26½c. to 2.36½c.; No. 16, 2.36½c. to 2.46½c.; Nos. 18 and 20, 2.50½c. to 2.60½c.; Nos. 22 and 24, 2.60½c. to 2.70½c.; No. 26, 2.70½c. to 2.80½c.; No. 27, 2.80½c. to 2.90½c.; No. 28, 2.90½c. to 3.00½c. Small lots for shipment from local stocks are met at from 10c. to 15c. over mill prices. Galvanized Sheets have been a little more active and slightly firmer at 75, 10 and 2½ to 75, 10 and 5 discount, mill shipment. Small lots from local stocks are selling at 75 and 5 to 75 and 2½ discount.

Cast Iron Pipe.—The steadily declining tendency of Pig Iron has induced large purchasers of Pipe, including municipalities, to hold off from contracting at least temporarily. There is no lack of interest in the market, but except small purchases for current requirements, neither gas nor water companies are buying. For a round tonnage lower prices prevail, but on the small current mail orders received quotations are as follows, f.o.b. cars, Chicago: 4-inch, $31; 6-inch, $30.50; 8-inch and larger, $30 for Water and $1 per ton higher for Gas Pipe.

Billets.—There has been little inquiry for round lots of Billets of any kind, and even the demand for jobbing lots has been much reduced. The last sales reported of both Bessemer and Open Hearth have been made at $28, f.o.b. cars, Chicago. Open Hearth Forging Billets are selling in small lots at from $33 to $38, according to analysis, buyer and time of delivery.

Merchant Pipe.—There has been an active demand for all sizes, some large contracts having been placed by jobbers during the past two weeks, and an active demand has also been experienced for large sizes and for Casing from the oil sections. The market continues firm in tone, the regular schedule of discounts being unchanged for carload lots, Chicago, base, random lengths, mill shipment:

	Steel Pipe.		Guaranteed Wrought Iron	
	Black.	Galvd.	Black.	Galvd.
	Per cent.	Per cent.	Per cent.	Per cent.
⅛ to ⅜ inch	66.35	56.35	63.35	53.35
½ inch	68.35	58.35	65.35	55.35
¾ to 6 inches	73.35	63.35	70.35	60.35
7 to 12 inches	67.35	57.35	64.35	54.35

Less than carloads, 12½ per cent. advance.

Boiler Tubes.—Producers have continued to receive fair contracts for Tubes, and are already well employed on previous contracts, but there has been a falling off in the demand from local distributers, though prices have remained unchanged, the following being the schedule of discounts for mill shipment:

	Steel.	Iron.
1 to 1¼ inches	40	35
1¾ to 2½ inches	55.85	35.85
2¾ to 5 inches	60.85	45.85
6 inches and larger	55.85	35.85

Less than carloads, 12½ per cent. advance.

The following is the schedule of discounts for shipment from local warehouse:

	Steel.	Iron.
1 to 1¼ inches	40	35
1¾ to 2½ inches	50	32½
2¾ to 5 inches	57½	42½
6 inches and larger	50	..

Merchant Steel.—A few additional Agricultural Implement manufacturers have placed orders for specialties, contracts for several hundred tons having been placed for the 1903-1904 season during the week, but in the main the market continues very quiet without essential change in prices, which are as follows for mill shipment: Smooth Finished Machinery Steel, 2.01½c. to 2.11½c.; Smooth Finished Tire, 1.96½c. to 2.11½c.; Open Hearth Spring Steel, 2.66½c. to 2.76½c.; Toe Calk, 2.31½c. to 2.46½c.; Sleigh Shoe, 1.86½c. to 1.96½c.; Cutter Shoe, 2.41½c. to 2.61½c. Ordinary grades of Crucible Tool Steel are quoted at 6c. to 8c. for mill shipment; Specials, 12c. upward. Cold Rolled Shafting in carload lots sells at 47 and in less than carload lots at 42 discount from list.

Rails and Track Supplies.—There has been an improved demand for both Standard and Light Rails for quick shipment, with sales during the past two weeks aggregating between 6000 and 8000 tons, about half of which has been taken during the past six days. But the demand for 1904 delivery has fallen off materially. Both Eastern and Western mills have shared in the little business current, and the transactions would be greater could local mills make deliveries required. About 500 tons of Seconds have also sold for quick shipment. Official prices remain firm at $28 for Standard and $27 for Second quality, mill shipment. Light Rails are quoted at $34 to $38; Track Supplies have been moderately active, and the market has remained steady, as follows: Splice or Angle Bars, 2c. to 2.10c.; Spikes, 2.10c. to 2.15c.; Track Bolts, 3½ to 3¾ inches and larger, with Square Nuts, 2.85c. to 2.90c.; with Hexagon Nuts, 3c. to 3.10c. From store 10c. to 15c. over mill prices are asked and obtained.

Old Material.—The market has continued heavy and weak in sympathy with Pig Iron, which has declined further during the past ten days. Rolling mills are still holding off or buying only for current consumption, and Open Hearth furnaces are less free buyers, being able to purchase Pig at a material reduction. At the same time offerings are not heavy or pressing. However, the tendency is toward lower prices. Heavy Relaying Rails are in better demand at concessions, among the sales during the week being 300 tons at $28, Chicago. The following are the prices current per gross ton, f.o.b. Chicago:

Old Iron Rails	$18.50 to $19.00
Old Steel Rails, mixed lengths	16.50 to 17.00
Old Steel Rails, long lengths	19.00 to 19.50
Heavy Relaying Rails	28.00 to 29.00
Old Car Wheels	21.50 to 22.00
Heavy Melting Steel Scrap	15.00 to 15.50
Mixed Steel	13.00 to 14.00

The following quotations are per net ton:

Iron Fish Plates	$15.50 to $16.00
Iron Car Axles	19.50 to 20.00
Steel Car Axles	18.50 to 19.00
No. 1 Railroad Wrought	14.25 to 14.75
No. 2 Railroad Wrought	13.50 to 14.00
Shafting	16.50 to 17.50
No. 1 Dealers' Forge	13.00 to 14.00
No. 1 Busheling and Wrought Pipe	11.50 to 12.00
Iron Axle Turnings	10.50 to 11.00
Soft Steel Axle Turnings	10.50 to 11.00
Machine Shop Turnings	10.00 to 11.00
Cast Borings	6.50 to 7.50
Mixed Borings, &c	7.50 to 8.50
No 1 Boilers, cut	.... to 13.00
Heavy Cast Scrap	14.00 to 14.50
Stove Plate and Light Cast Scrap	10.00 to 10.50
Railroad Malleable	14.50 to 15.00
Agricultural Malleable	13.50 to 14.00

Metals.—Copper has continued slow and easy, there being but little purchasing in small lots. Casting is offered at 12¾c., and Lake at 13c., in carload lots. Spelter is in more ample supply for August and September shipment, sales being made on the basis of 8½c. in carload lots. Sheet Zinc is steady at 6¾c. Small lots of Tin are sold at 30c. Lead is nominally unchanged, with a fair movement, and the output of the mills contracted for some time in the future. Prices remain nominal at 4.05c. in 50-ton lots, with 2½c. additional obtained for car lots. Old Metals are in light demand, and the market is easy, as follows: Heavy Cut Copper is 11¼c.; Red Brass, 10½c.; Copper Bottoms, 10¼c.; Lead Pipe, 3.70c., and Zinc at 4.65c., spot.

Coke.—There has been a moderate degree of activity during the week, sales being mainly for future delivery, prime Connellsville 72-hour Foundry Coke having been sold at $3 and Furnace Coke at $2 at the ovens. West Virginia Coke, both foundry and furnace, is selling at about the same price as Connellsvile. Small lots of all kinds have been sold at from 25c. to 50c. per ton over the above prices. The International Harvester Company are reported to have contracted for 6000 cars of Coke for delivery into next March. The spot market is in better condition than for many weeks, supplies which have been pressing having been well taken care of.

Philadelphia.

FORREST BUILDING, August 18, 1903.

It is a difficult matter to define the condition of the Pig Iron market. There are some people who will always talk things up, but the most conservative men in the trade admit that the situation is extremely problematical. To-day's selling prices are so close to cost that there is no money in it to furnace owners, so that something must be done to straighten things out. Some furnaces may be "blown out" or be banked, others will go on making Iron, expecting to get out on cheaper fuel and in other lessened expenses; but the concensus of opinion is that there will be no important change in the immediate future. Probably the turn will depend more on the consumption of Pig Iron than on production, as the latter can be correctly estimated, while consumption requires considerable time to demonstrate its exact character. So far as can be gathered from a general inquiry in the trade it does not appear that there is any material falling off in the foundry trade, but in the mill trade the loss is quite serious, although as yet it is impossible to say with certainty what the proportions are as regards supply and demand, and moreover, things are at a point when they might easily become much better or much worse. The trade were probably never more alert in regard to the situation than they are to-day. Consumers cannot be induced to buy more Iron than they know they will require within the next 60 or 90 days—proof positive that they have their doubts in regard to values—and while sellers are willing to discount the future to a moderate extent, they do so in anticipation that, if a further decline should come, they will be able to recoup themselves on a reduced cost of production. It will be seen, therefore, that the feeling is still very much unsettled, the only suggestive feature being that, while there is no talk of higher prices, there is some doubt of the permanency of to-day's quotations. There may be nothing in this except that it is a reflection of the general feeling in regard to the situation and its prospects in the near future.

Pig Iron.—The situation is not materially different to what it was a week ago. Sales may represent an increased tonnage, but the buying was of a desultory character, and not such as to give definite character to the market. When lots of any size were taken they were at low prices, while even small lots were hardly as firm as they were a week ago. The buying, therefore, was not of a very confident character, and indicated either that lower prices were regarded as probable, or that the requirements of the buyer were not very large. Under these conditions it is impossible to make confident assertions in regard to price movements in the near future. Some well informed people are inclined to think that bottom figures have been reached for the present and that a good volume of business will be placed on the basis of to-day's quotations. Later developments will probably determine the course of the market for an indefinite period, but at present even the best judges hesitate to express decided opinions. Sales in small lots have been on the basis of $17 to $17.50, delivered, for No. 2 X Foundry; large lots at about 50c. less, at which the market may be called fairly steady. Inquiries are somewhat numerous, and it looks as though there would be a fair degree of activity at about the following prices, delivered Philadelphia or equivalent points:

No. 1 X Foundry	$18.00 to $18.50
No. 2 X Foundry	16.75 to 17.50
No. 2 Plain	16.25 to 16.50
Standard Mill Irons	15.75 to 16.25
Ordinary Mill Irons	15.25 to 15.50
Basic	16.00 to 16.25

Steel Billets.—There is a good deal of inquiry and quite a nice batch of orders have been taken in small and medium sized lots at $28.50 to $29, delivered, for Basic. There is nothing doing in outside Steel, although foreign is offered at about $27.50, ex-ship, duty paid.

Plates.—Business is not good by any means. There is a fair run of small orders, and on these mills are fairly employed, but there are no orders of any magnitude. Neither can it be said that prospects are favorable, as many large

consumers appear to have much less business on hand than they had several months ago. Prices are unchanged as follows for city and nearby deliveries, base prices up to 100 inches: Tank Steel, both Sheared and Universal, 1.75c. to 1.80c., in large lots; Flange, 1.85c. to 1.90c.; Commercial Fire Box, 1.95c. to 2c.; Locomotive Fire Box, 2.25c. to 2.30c.; small lots, 10c. to 15c. per 100 extra; 100 to 110 inches, 0.05c. extra; 100 to 115 inches, 0.10c. extra; 115 to 120 inches, 0.15c. extra; 120 to 125 inches, 0.25c. extra; 125 to 130 inches, 0.50c. extra; over 130 inches wire, 1c. extra; Plates under ¼ inch on edge, 0.10c. extra; under 3-16 inch on edge to No. 8, 0.15c. extra; No. 9, B. W. G., 0.25c. extra.

Structural Material.—What has been said in regard to Plates applies much the same to Structural Material, which has not been very active for several weeks past. Strikes in the building trades have worked serious injury, and it is doubtful if there will be any recovery this year. At present the demand is poor and prospects for the near future are not very encouraging, although prices on the following basis are well maintained: Beams, Angles or Channels, ordinary sizes, 1.73½c. to 1.80c. for carload lots, with the usual addition for smaller quantities.

Bars.—The Bar Iron trade is much the same as quoted last week. There is no general demand, and most of the mills could do 20 to 30 per cent. more work if orders could be had. Prices are irregular, 1.60c., delivered, being about a fair average price for strictly Refined Iron in carload lots, although some mills will go half a tenth to a tenth lower; but the quality is uncertain and only a few sizes are made. Steel Bars are held at combination prices, but the demand is rather slow.

Sheets.—There is a good demand for Heavy Sheets, but Light Sheets are somewhat dull and a little uncertain as regards prices.

Old Material.—The demand is extremely light, and in the case of pressure to sell very low prices have to be accepted. It is difficult to give exact prices, but for deliveries in buyers' yards the range would be about as follows:

Old Steel Rails	$17.75 to $18.25
Heavy Steel Scrap	17.50 to 17.75
Low Phosphorus Scrap	26.00 to 27.00
Old Steel Axles	20.00 to 21.00
Old Iron Rails	19.50 to 20.50
Old Iron Axles	21.00 to 22.00
Old Car Wheels	19.00 to 20.00
Choice Scrap, R. R. No. 1 Wrought	17.50 to 18.50
Country Scrap	16.00 to 17.00
Machinery Scrap	15.50 to 16.00
No. 2 Light Scrap	16.00 to 17.00
No. 2 Light (Ordinary)	11.50 to 12.50
Wrought Turnings	13.00 to 14.00
Wrought Turnings, Choice Heavy	14.50 to 15.00
Cast Borings	8.25 to 8.75
Stove Plate	11.75 to 12.25

St. Louis.

CHEMICAL BUILDING, August 19, 1903.—(*By Telegraph.*)

Pig Iron.—The past few days have marked a considerable increase of trade in the Iron market, attributable to the decision of the associated Southern furnaces to place No. 2 Foundry on a $12, Birmingham, basis. Contracts now being placed generally cover the third and fourth quarters and aggregate several thousand tons. The market will undoubtedly broaden out from this time on, and when we begin to get the contracts of greater magnitude the influence, it is thought by the trade, will stir the whole market to great activity. We quote, f.o.b. St. Louis, as follows:

Southern, No. 1 Foundry	$16.25 to $16.50
Southern, No. 2 Foundry	15.75 to 16.00
Southern, No. 3 Foundry	15.25 to 15.50
Southern, No. 4 Foundry	14.75 to 15.00
No. 1 Soft	16.25 to 16.50
No. 2 Soft	15.25 to 15.50
Gray Forge	14.75 to 15.00
Southern Car Wheel	26.75 to 27.00
Malleable Bessemer	19.25 to 19.75
Ohio Silvery, 8 per cent. Silicon	23.00 to 23.50
Ohio Strong Softeners, No. 1	19.25 to 19.75
Ohio Strong Softeners, No. 2	18.75 to 19.25

Bars.—The volume of transactions in the Bar market the past week shows an improvement, and jobbers anticipate that the call on their stocks will continue to grow more liberal. We quote from the mill: Iron Bars, 1.70c. to 1.75c.; Steel Bars, 1.82½c. Jobbers continue to quote 2.15c. to 2.25c.

Rails and Track Supplies.—Trade has continued to come up in this department, and the total volume is said to be quite large for the week under review. We quote as follows: Splice Bars, 2.05c. to 2.15c.; Bolts, with Hexagon Nuts, 3.05c. to 3.15c.; with Square Nuts, 2.90c. to 3c.; Spikes, 2.15c. to 2.25c.

Angles and Channels.—Store trade in small Angles and Channels continues in fair volume, and jobbers name a quotation of 2.25c. to 2.40c., according to quantity.

Pig Lead.—The Lead market is said to hold very steady with a quick shipment demand at 4.10c. to 4.12½c. for Missouri brands.

Spelter.—Activity in this department is not very pronounced just now, but a steady and firm tone rules, with quotation at 5.50c.

Cleveland.

CLEVELAND, OHIO, August 18, 1903.

Iron Ore.—Not even inquiries have been reported the past week. The general expectation now seems to be that less Ore will be moved this year than last, not because there will necessarily be a lessening of consumption, but because of the heavy stock held over at the beginning of the year, which will more than suffice to supply the new stacks. The lake trade is steady with a heavy movement. The speed of which the transportation facalities are capable is not fully demonstrated because of dock and car conditions. The movement so far in August has been short of the showing for July, and also less than in August a year ago. Wild Ore is getting scarce at some ports, particularly Escanaba. From other ports the movement is still free, but it is evident that there will be less late wild Ore this year than ever. Rates of transportation are unchanged at 80c. from Duluth, 72½c. from Marquette and 60c. from Escanaba. The prices quoted on Ore are also unchanged, being $4.50 for Bessemer old range and $4 for Bessemer Mesaba as a basis.

Pig Iron.—The selling of small lots of Foundry for immediate shipment continues to be the sole demonstration of activity in that line of the trade. The sales are as heavy as at any time in the recent past, but the demand has not increased. In this territory prices have held steady, No. 2 Foundry continuing to bring $17 in the Valleys. A few of the Valley furnaces are still out for the usual midsummer repairs, and the remaining stacks have had little or no difficulty in meeting the requirements. Advance buying is prevented by the uncertainty as to prices for the fourth quarter, the general impression being that values will be lower than at present. Southern conditions continue to affect this market by accentuating the uncertainty as to future prices. The production from the active stacks in the Valley is heavy and shipments are made rapidly. The Coke supply is adequate to all present purposes. A car shortage is threatening however, and some fears are expressed. In the Bessemer trade no sales have been made of importance. A few reports are current of round lots having been covered for fourth-quarter delivery, but they seem to be of little significance. The association has done nothing. The price holds at about $18 in the Valley, the quotation being nominal. The furnace of the Cleveland Furnace Company, which is to run on Bessemer, met with an accident, and the beginning of operations was delayed until the first of this week. The Basic trade is quiet, with very little activity reported. The demand is light, and even inquiries for fourth-quarter delivery are absent. Nominally the price is about $18 in the Valleys.

Finished Iron and Steel.—The Cleveland market is inclined to be bullish in Finished Material. Consumption in general lines has gone on apace; there have been no cancelations of contracts of any moment; specifications against contracts have been steady, even though not big, and all of the concerns consuming Steel have continued to operate at top speed. The only thing that at all detracts from the bull side of the market is that some of the consumers do not show such marked activity in their estimating departments. A strong buying period, within a reasonable length of time, has been freely predicted by the producers, in which some of the consumers have joined. Orders for Sheets have been coming in steadily, even though the aggregate tonnage has not been quite as heavy as recently. Some of the mills are shut down for want of business, and the others are in position to make good prompt delivery, but the trade, at that, is better than some of the other lines. Some of the smaller concerns are shading prices to get business, especially on choice specifications, but in the main the business done through the jobbers has been at about association prices. The old quotations, therefore, are continued as follows: No. 27 Black Sheets out of stock, 3.05c., as a basis; No. 14, Blue Annealed, 2.20c. in carlots at the mills, as a basis; No. 27 one pass cold rolled, 2.75c. in car lots at the mills; No. 27 Galvanized Sheets, 4c., out of stock, as a basis. Buying of Bar Iron is a little heavied. The consumers are beginning to look around at a lively pace, and the prospects are for a good trade soon. Prices continue to indicate that the producers are meeting local conditions. The quotation at Cleveland is 1.60c., but the mills are meeting outside competition by making the price about 1.55c., at the mill. Bar Steel prices have held steady under pressure. The buying has been hand to mouth, and when contracts have been placed, in a few instances only, the consumer has been insured against a decline in the general market. The market is still, therefore, represented by a quotation of 1.60c., Pittsburgh, for Bessemer, and 1.70c., Pittsburgh, for Open Hearth. In the Plate trade booking is light, but specification against old contracts has been moderately heavy. A few mills have suspended operations. The price from all mills holds at 1.60c., Pittsburgh. No cut under that price has been reported here. In Structural all of the present demand is supplied from

mills, the jobbers having little or no business. The demand is light, and conditions are identical with the Plate trade. Prices hold at 1.60c., Pittsburgh, on mill sales and 2.15c. out of stock.

Old Material.—The market has been dull and without sales. The inquiries have begun to indicate a little business immediately ahead, but nothing was done the past week. Nominal quotations alone prevail. They are, gross tons: Heavy Melting Steel, $18.50; Old Steel Rails, $18.50; Old Iron Rails, $22; Old Car Wheels, $19; Railroad Malleable, $17; Cast Borings, $8.50. All net tons: No. 1 Railroad Wrought, $18; No. 1 Busheling, $14.50; Wrought Turnings, $12; Iron Car Axles, $22.50; No. 1 Cast Scrap, $14.50; Stove Plate, $11.50.

Birmingham.

BIRMINGHAM, ALA., August 16, 1903.

The better conditions of the market as noted in last letter were maintained during the week just ended, with the promise of a continued improvement. There are under negotiation some round lots of Iron, but the buyers are hesitating. While there is an improvement in the tone of the market and in the volume of reported sales, there is still no snap to the buying, and what is being done is for the supplying of pressing needs and it is limited to 30 and 60 days' delivery. The makers of Iron are confronted just now with two serious problems—1, An accumulation of Iron, that is growing larger every day, and, 2, the threatened increased cost of production to result if the demands of the miners are granted. As to the first proposition, there is an accumulation of over 125,000 tons in furnace yards at present, and of this amount 80,000 tons or more are for account of one interest. The prospects are that we will, in the near future, have to deal with the same conditions that prevail in the West, where a threatened car famine is developing into a reality. Now, if this Iron is held for the future market, the limited facilities will be inadequate for moving it promptly and present conditions will only be intensified. What will move this Iron promptly? What will anticipate the inadequacy of transportation facilities that we are shortly to confront? The answer is plain, and that is, move the Iron now. This is the line of thought that existing conditions generate in reflective minds, and it is actuated by developments as they occur in the Court of Arbitration now in session. But how can this Iron be moved? There is only one way, and that is to lower the price. If the price was lowered to $12, it is claimed that there would be a rush for Iron for delivery the balance of this year that would absorb the output of all our furnaces, and we would be rid of the incubus of large amounts in furnace yards begging buyers. Besides that advantage, it would put us on a competitive basis with Northern Irons, as we could sell our Iron on the basis of $17, delivered, for No. 2 Foundry to the Pittsburgh district. Besides the attainment of these results, it would influence the fate of the miners' demands, for an increase of wages would not be likely to occur in the face of decreased market values. If prices were reduced as above outlined, we would be only on a parity with competition. Such thoughts as are above set forth are under serious consideration by conservative and thoughtful operators. "The unexpected always happens," so one need not be astonished if at any time the trade is treated to a surprise of lowered values. It is a common sense proposition that Iron must have a satisfactory price to command an active trade. The abnormal demand that prevailed has decreased, and the horoscope of the future shows that we have reached the crest of the wave in prices and are going back to conservatism. It was developed before the Court of Arbitration that at $12 Iron in this district could be sold at a fair living profit.

The Court of Arbitration to settle the differences between the operators and the miners has been the center of attraction the past week. It will terminate this week. Great latitude has been given in probing the business of the operators, and their methods in its conduct have been ruthlessly and unsparingly attacked and much irrelevant matter aired. The miners are making an aggressive and stubborn fight, and are now alert and watchful and combative on every point affecting their claims. The operators contend that to concede the miners' claims is to increase the cost of production 20 per cent. or more and drive them out of competitive markets, and this increase will increase the cost of making Iron, because it increases the cost and amount of labor employed by furnaces. For instance, it would require three shifts at all the furnaces, where two now answer. Epitomized, the miners want less work and more pay, and the operators the same pay existing now (in some instances less) and better work. To illustrate, at one mine, where 768 men are employed, five men worked during February (selected as an average for the year) 22 days and over; 386 worked 12 days or less, when they might have worked 23 days, and so on down to less than five days. Between the extremes the number of days was very irregular. Now the operators demand that a specified number of days be named when the miner shall work, as the fixed charges of the mine are the same in case of fair work or unsatisfactory work. Upon the question of commissaries, or stores, run by the companies for the benefit of the employees there was much dispute, each side endeavoring to show that the other was the beneficiary. Concerning the eight-hour day the fight is lively. The operators contend that it would entail large cost to adapt their plants to it; and prove in the end very unsatisfactory.

(*By Telegraph.*)

AUGUST 19, 1903.

As foreshadowed in last letter the price of Iron has been lowered to basis of $11.50 per ton, to take effect from date. The difference between grades remains unchanged. This makes No. 2 Foundry $12 and No. 4 Foundry $11, while No. 1 Foundry is $12.50 and Gray Forge $10.75. It is anticipated that the drop in prices will stimulate demand and it will be a sore disappointment if it fails to do so, as the president of the Tennessee Company testified this week before the Board of Arbitration that it cost his company $10.87 per ton to make Iron during the month of July just past. This shows but a small margin of profit at the new price. It is too early to forecast the effect, but the inquiries for confirmation of report are quite frequent. The drop simply places this district on a parity with competing interests as to price, and obliterates foreign importation for the present. The Arbitration Board will finish its sittings this week and render its verdict. It is evident to one who has followed the proceedings that a decision granting a part, at least, of the miners' demands was fast being reached. The decline just made in Iron may change the trend of feeling, for it is difficult to award increased wages to miners and saddle increased costs on the furnace interests in the face of a declining market, with the possibility of further shape in price. The board has aired well the business of the corporations, and their cost sheets are now as open pages to the general public.

Pittsburgh.

PARK BUILDING, August 19, 1903.—(*By Telegraph.*)

Pig Iron.—While the Pig Iron market remains quiet, there is a little more inquiry, but the amount of actual tonnage being placed is small. The action of the Southern Furnace Association in making a cut of $1.50 a ton in prices of Southern Foundry and Forge Iron will not affect the local markets to any extent. Under the new schedule No. 2 Southern Iron is $12, Birmingham, equal to $16.85, Pittsburgh; but Northern brands of No. 2 Foundry are being offered at $17, Pittsburgh or less, so that there is little chance of Southern Iron getting into this market. We understand that two large interests in the Southern Furnace Association insisted that the last cut in prices be made, and the other furnaces were compelled to acquiesce. The new price on Southern Forge is $10.75, Birmingham, or $15.60, Pittsburgh; but local brands of Forge are being offered at practically this price, so that there is not much probability of Southern Forge coming into this market. Very little is doing in Bessemer Iron, and reports are going of all kinds of prices being made. It is a fact that Bessemer Iron is being offered in fair sized lots at $17, Valley furnace, equal to $17.85, Pittsburgh, and it is stated that it has been offered at even lower prices. None of the large consumers of Pig Iron are buying, and any Iron changing hands is in small lots and often at considerable change in prices.

Steel.—There is some inquiry for Steel, one concern asking prices on 1000 tons of Open Hearth Slabs for September and October delivery. We are advised that matters in the Billet arrangement are moving along smoothly, and the mills are adhering rigidly to fixed prices in making quotations. The Bessemer plant of the Wheeling Steel & Iron Company, which has been idle for some time, will start up Thursday morning, August 20. The Republic Bessemer plant at Youngstown is also running. We quote Bessemer Billets at $27; Open Hearth, $28, Pittsburgh, Wheeling or Valley delivery.

Coke.—The unsatisfactory condition of the Coke market continues, and more Coke is being offered than the market will take, with the result that low prices are being made, particularly for delivery in the Eastern markets. Strictly Connellsville Furnace Coke for prompt shipment continues to be offered at $2 to $2.50 a ton, and 72-hour Foundry at $3 a ton. Main line Coke made outside the Connellsville region is being offered at still lower prices. Most of the Coke plants in the Connellsville region remain idle on Thursday of each week in order to decrease the output, which is already showing a large falling off. The output this week is expected to be below 240,000 tons, the smallest for a long time.

Iron and Steel Scrap.—The market continues very dull, and prices are merely nominal. Open Hearth Melting Stock is being offered below $20 in gross tons, and No. 1 Wrought Scrap about $17 in net tons.

(*By Mail.*)

About the only event of interest in the otherwise quiet week in the Iron trade has been the reduction of $1.50 in

prices of Southern Foundry and Forge Iron, made at a meeting of the Southern Furnace Association held in Birmingham, Ala., on Monday, August 17. The new schedule of prices adopted, and which went into effect on above date, are as follows: Southern, No. 2 Foundry, $12; No. 3, $11.50; No. 4, $11, and Gray Forge, $10.75, all f.o.b. Birmingham, the freight to Pittsburgh being $4.85 per ton. Under this new schedule of prices Southern No. 2 Iron is $16.85, Pittsburgh, but it is doubtful whether any considerable quantity of Iron from the South can come into this market, for the reason that Northern grades of No. 2 Foundry Iron are being offered as low as $16.50 a ton, the open market being about $17. It is a fact, too, that most of the large consumers of Foundry Iron in the Pittsburgh district have large stocks, and are not expected to do much buying for the next two or three months. The local situation in Pig Iron is very quiet, and very little Iron is changing hands. Bessemer is being freely offered as low as $17 a ton, at Valley furnace, and it is said that $16.50 has been quoted in exceptional cases. This Iron is being offered by brokers and furnaces outside the Bessemer Furnace Association. The Steel market is quiet and sales of Billets and Bars by the pool are relatively small. In Finished Iron and Steel the last three or four days have witnessed a much better inquiry, and actual tonnage being placed is a little larger. The impression seems to prevail that present prices on Structural Material, Plates and Steel Bars, which are fixed by agreement, may not hold, and this is causing buyers to place orders only for small lots. It would seem that the impression that prices on these materials would be lower is not well founded, as large interests claim there will be no reductions made whatever and that present figures will stand. The argument is used that to reduce prices would not mean the consumption of a pound more of material, but would simply have the effect of unsettling the market and would not do any good in any way, but would work harm. The labor troubles have seriously restricted demand for various forms of Finished Iron and Steel, and as these troubles are being gradually settled the effect ought to be to cause an increased demand before long.

Ferromanganese.—The Carnegie Steel Company are now sellers of Ferro, their output being larger than their own needs. English and domestic Ferro is still held at $50, delivered, for 50-ton lots and over, while German is offered at $49. There is very little doing, the large consumers being covered, and the few orders being placed are for small lots only.

Muck Bar.—A sale of 1000 tons of domestic Muck Bar is reported at a price equal to about $29.50, Pittsburgh. We quote at $29.50 to $30, delivered.

Plates.—Demand for Plates in the last few days has been slightly better, but is still confined to small lots, as buyers seem to have the impression that the present price of Plates, which is based on 1.60c. for Tank, ¼-inch and heavier, may be reduced. We can state that the Plate mills have never considered the question of making a reduction in prices and no meeting of the association will be held until the regular quarterly meeting in October next, when present prices will be reaffirmed. It is admitted that demand for Plates has fallen off very considerably in the past two months, but to make any reduction in the price would not improve the situation and would not result in a ton more of Plates being used. For these reasons it is safe to assume that present prices of Plates will continue in force for a long time. We quote: Tank Plate, ¼-inch thick and up to 100 inches in width, 1.60c., at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine, Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.90c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price up to 3c. Plates more than 100 inches wide, 5c. extra per 100 lbs. Plates 3-16 inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra; No. 9, $5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms net cash in 30 days.

Steel Rails.—Tonnage being placed is for small lots only, a good deal of it for trolley roads. No large contracts have been let for some time. We quote at $28 at mill for Standard Sections in 500-ton lots and over.

Structural Material.—No large contracts for either bridge or building work have been placed since our last report. The Structural trade has been hurt very much by the decline in securities and the tightening of the money market, causing the postponement of a good deal of new work. Some bridge work for the New York Central and other Eastern roads is to be placed this week, but no local contracts of importance are in sight. Some of the local Structural shops are getting very short of work. Deliveries of material are now being made by the Carnegie Steel Company for the new Oliver department store, now being built on Wood street, in this city. Mills are making very prompt deliveries on the little new tonnage that is coming up, and we quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6, 1.60c.; Zees, 1.60c.; Tees, 1.60c.; Steel Bars, 1.60c., half extras, at mill; Universal and Sheared Plates, 1.60c. to 1.70c.

Iron and Steel Bars.—We note a slight increase in demand for Steel Bars, a number of consumers that were waiting for lower prices having been forced to come in the market recently and place contracts. The fixed price is 1.60c. on Steel Bars and efforts of consumers to shade it have been unsuccessful. The fact that the mills now guarantee prices against decline is also causing buyers to place orders more freely. The situation in Iron Bars is not very satisfactory, there being more or less cutting in prices, and new tonnage offering is not large. We quote Iron Bars at 1.60c. to 1.65c., Pittsburgh, the lower price being made on carloads and larger lots. We quote Steel Bars at 1.60c., Pittsburgh, in carloads and larger lots. For quantities less than 2000 lbs., but not less than 1000 lbs., $2 a ton additional is charged, and less than 1000 lbs., $6 additional.

Tin Plate.—In the past week contracts for fully 20,000 boxes of Tin Plate have been placed for September and later delivery, most of this business going to outside mills. The price of the leading interest remains at $3.80 for 100-lb. Coke Plates, f.o.b. Pittsburgh, but in many cases outside mills are able to get 5c. to 10c. per box additional.

Sheets.—There is a fair amount of inquiry for Black Sheets, but tonnage is not satisfactory. The trade seem to be more or less apprehensive of a reduction in prices, and for this reason are buying very cautiously. A better demand for Sheets is expected as soon as fall trade opens up. We continue to quote No. 27 Black Sheets, box annealed, one pass through cold rolls, at 2.60c., and No. 28 at 2.70c., f.o.b. at mill. It is possible that on a very nice specification this price might be slightly shaded by some mills. We quote Galvanized Sheets at 75, 10 and 5 per cent. off in carloads and larger lots, f.o.b. maker's mill. For small lots from store jobbers charge the usual advance over these prices.

Hoops and Bands.—New tonnage in Hoops and Bands is lighter than for some time, but it is claimed fixed prices are being rigidly held. We quote: Cotton Ties, 87c. in 10,000-bundle lots or over; 92c. for carloads; Steel Hoops, 1.90c. in 250-ton lots and 2c. for carloads; Bessemer Bands, 1.60c. to 1.70c. for Open Hearth. Extras as per Steel card.

Rods.—There is some inquiry in the market for Rods, which is expected to lead to some business being placed before long. We quote Bessemer Rods at $35 to $35.50 and Open Hearth at $36. Chain Rods, special stock, are held at $37.50 to $38, Pittsburgh.

Skelp.—A local mill reports a sale of about 1000 tons of Grooved Iron Skelp at a price equivalent to about 1.82½c., Pittsburgh. We quote Grooved Iron and Steel Skelp at 1.82½c., and Sheared at 1.87½c. to 1.90c., Pittsburgh.

Pipes and Tubes.—Demand for Merchant Pipe at the present time is in excess of this time last year, and the leading mills have plenty of business on their books for the next two or three months. On Pipe 6 inches and larger the mills are practically out of the market to January 1, and are very much behind in deliveries on contracts. Demand for Boiler Tubes is excellent and the mills are not promising deliveries under four or five weeks. The fact that demand for Boiler Tubes is heavy is regarded as a very favorable indication of the general market, as this product largely goes into new motive power which will consume other forms of Steel. There is no change in prices, which are very firm, discounts to consumers in carloads being as follows:

Merchant Pipe.

	Steel.		Wrought Iron.	
	Black.	Galv.	Black.	Galv.
	Per cent.	Per cent.	Per cent.	Per cent.
⅛, ¼ and ⅜ inch	68	58	65	55
½ inch	70	60	67	57
¾ to 6 inches	75	65	72	62
7 to 12 inches	69	59	66	56

Merchant Boiler Tubes.

	Steel.	Iron.
1 to 1½ inches	42½	39
1¾ to 2½ inches	55½	38
2¾ to 5 inches	61	48
6 to 13 inches	55½	38

The outside mills rolling Iron Pipe are naming lower discounts than are given above.

Labor Bureau a Success.—The Worcester, Mass., Labor Bureau, established by the Worcester Metal Trades Association two months ago, has already demonstrated that it is a success. The workmen are using it very generally when they are seeking employment, and many have been placed in good positions. The manufacturers have been provided with men without delay. The bicycle messenger service, already referred to in *The Iron Age*, by which each member of the association is visited each day and provided with a list of applicants for work and their qualifications, has worked exceedingly well. The bureau appears to have the tendency of bringing employer and employee nearer together, the feeling of distrust which it was feared the workman would have for the bureau having been dispelled by the practical results achieved.

Cincinnati.

FIFTH AND MAIN STS., August 19, 1903.—(*By Telegraph.*)

The action of the Southern Association at their Birmingham meeting, on Monday of this week, in reducing prices places the furnaces composing it on a level with the market for the first time in some months. It is generally believed that the "outside" furnaces are well sold up for the next 45 days, and whatever demand there is for prompt shipment Iron will fall to the association concerns. There is a plentiful supply of all grades of Southern Iron to supply any call that is likely to be made at this time. There is now but one basis for Southern Iron, and that is on the price of $12 for No. 2, f.o.b. Birmingham. The announcement of the new basis has caused quite a stir in Iron melting circles, as well as among selling agents. Many options which were out on Iron on the present basis have expired, and in some instances the would-be buyers are wanting still further reductions. Quite a little Foundry Iron, however, has been already sold, generally in small lots and for prompt shipment. Inquiry is very brisk to-day, and the week coming may prove an active one. The feeling is certainly brighter. There has been some more buying of Malleable Iron in the lake districts by agencies with Cincinnati headquarters. These additional sales make a large tonnage of that class disposed of recently. Freight rates from the Hanging Rock district, $1.50, and from Birmingham to Ohio River points, $3.25. We quote, f.o.b. Cincinnati, for delivery throughout the year, as follows:

Southern Coke, No. 1	$15.75 to	....
Southern Coke, No. 2	15.25 to	....
Southern Coke, No. 3	14.75 to	....
Southern Coke, No. 4	14.25 to	....
Southern Coke, No. 1 Soft	15.75 to	....
Southern Coke, No. 2 Soft	15.25 to	....
Southern Coke, Gray Forge	14.00 to	....
Southern Coke, Mottled	14.00 to	....
Ohio Silvery, No. 1	20.15 to	$21.15
Lake Superior Coke, No. 1	17.15 to	17.65
Lake Superior Coke, No. 2	16.65 to	17.15
Lake Superior Coke, No. 3	16.15 to	16.65
Car Wheel and Malleable Irons.		
Standard Southern Car Wheel	$26.25 to	$26.50
Lake Superior Car Wheel and Malleable	23.50 to	24.00

New York.

NEW YORK, August 19, 1903.

Pig Iron.—Buying is proceeding pretty freely in quantities of moderate size. Contracts are rarely for over 1000 tons, and in fact do not often reach that figure. Foundrymen are sailing very close to shore, as shown by frequent requests for immediate shipment after signing contracts for quantities to begin delivery next month. Basic is in demand in small lots, but here also consumers are quite bare of stocks, with possibly one important exception, and makers are requested to ship promptly. The reduction in the official Southern price has not affected quotations in this market, as they were previously on the level now reached by the associated Southern makers. We quote, at tidewater: No. 2 X Foundry, $16.50 to $17; No. 2 Plain Foundry, $16 to $16.50; Gray Forge, $15.50 to $16; Basic, $16 to $16.50. Tennessee and Alabama brands: $16.75 to $17 for No. 1, $16.25 to $16.75 for No. 2, and $15.75 to $16.25 for No. 3.

Steel Rails.—The market is quiet. Prices quoted are $28 for Standard Rails and $32 to $34 for Light Rails.

Cast Iron Pipe.—The New York City letting for 7000 tons of Pipe, to which allusion has previously been made, was scattered among a number of foundries, instead of being placed with a single manufacturer. A continued excellent business is reported in small lots. It is considered that the season is now too late to look for much big business, nothing large being in sight at present. Quotations on carload lots are continued at $34 per gross ton, at tidewater, for 6 to 10 inch, and $33 for 12-inch upward, these prices being shaded on large lots.

Finished Iron and Steel.—The local situation has not cleared with respect to labor troubles. A fresh complication has been introduced by the threat of a sympathetic strike in the local shipyards for the purpose of assisting the striking machinists. It is hoped that this movement will not be successful. Quite a number of the trades involved have contracts with their employers, and it would be a violation of these contracts if the unions concerned should decide to participate in the sympathetic strike. No business of importance has transpired in building or bridge work. The 10,000-ton contract of the New York Central has not yet been placed, but bids have been received and an award is expected soon. The Plate trade is quiet. Bar Iron is weak, with some very low prices reported, but it is questionable whether the quality of the Iron offered at the lowest rates is up to standard. Bedstead or 1-inch Angles are the object of lively competition by various makers. We quote at tidewater as follows: Beams, Channels and Zees, 1.75c. to 2c.; Angles, 1.75c. to 2c.; Tees, 1.80c. to 2c.; Bulb Angles and Deck Beams, 1.90c. to 2.25c. Sheared Steel Plates, in carload lots, are 1.78c. to 1.85c. for Tank, 2c. to 2.10c. for Flange, 2.10c. to 2.20c. for Marine and 2.25c. upward for Fire Box. Refined Bars are 1.60c. to 1.80c.; Soft Steel Bars, 1.70c. to 1.80c.

Old Material.—Transactions are very light. Neither foundries nor rolling mills are disposed at present to make purchases beyond the minimum quantities necessary for their immediate requirements. Railroads are offering large lists of Old Material, but almost invariably they withdraw from the market after bids are received, as they are not considered satisfactory. Quotations are wholly nominal, approximate figures being as follows, per gross ton, New York and vicinity:

Old Iron Rails	$19.00 to $19.50
Old Steel Rails, long lengths	18.00 to 18.50
Old Steel Rails, short lengths	15.50 to 16.00
Relaying Rails, heavy Sections	22.00 to 23.00
Old Car Wheels	17.00 to 18.00
Old Iron Axles	22.50 to 23.00
Old Steel Car Axles	20.00 to 21.00
Heavy Melting Scrap	15.50 to 16.00
No. 1 Railroad Wrought Iron	16.00 to 17.00
Iron Track Scrap	15.50 to 16.00
Wrought Pipe	11.50 to 12.00
Ordinary Light Iron	8.50 to 9.00
Cast Borings	6.00 to 7.00
Wrought Turnings	12.00 to 12.50
No. 1 Machinery Cast	15.50 to 16.00
Stove Plate	10.00 to 10.50

Metal Market.

NEW YORK, August 19, 1903.

Pig Tin.—The market has shown some activity in a speculative way, but consuming business was very slow. Prices declined considerably, as compared with last week, and the market at this writing is in a rather unsettled condition. Spot is quoted 27.80c. to 28c. The August quotation is 27.75c. to 28c., and September 27.62½c. to 28c. It will be noted that the premium on spot has disappeared entirely. The London market declined £1 5s. on spot and advanced on futures. The London quotations are as follows: Spot, £127; futures, £124 5s. The arrivals thus far this month aggregate 2525 tons, and 1520 tons are afloat.

Copper.—As the result of a concerted movement, prices have advanced rapidly from day to day throughout the last week. As soon as the upward movement in prices began a number of consumers who evidently wished to protect themselves as far as their known requirements were concerned entered the market and placed orders which were rather large in comparison with the amount of business that has been going through lately. At this writing we quote: Lake, 13.62½c. to 13.75c; Electrolytic, 13.50c. to 13.62½c., and Casting, 13.25c. to 13.37½c. The London market has also increased materially, and to-day's cables are as follows: Spot, £59 10s.; futures, £58 15s.; Best Selected, £63 15s. The exports so far this month amount to 4547 tons, showing an improvement upon last month.

Pig Lead.—Spot is very scarce and the market firm. The prices of the American Smelting & Refining Company are unchanged, being on a basis of 4.10c. for 50-ton lots and 4.12½c. in carload lots. Outside lots of spot are quoted here 4.25c., and delivery for the balance of this month is bringing 4.20c. The London market has advanced to £11 6s. 3d.

Spelter.—The market has gained continued strength and spot to August closed to-day at 6c. The London market is also advanced, being quoted to-day £20 12s. 6d.

Antimony.—Cookson's is easier at 7.25c., while Hallett's has declined to 6.37½c., and other brands to 6c. to 6.25c.

Nickel—Is quoted at 40c. to 45c. for large quantities, and 50c. to 60c. in small lots.

Quicksilver.—The market continues at $47.50 for flasks of 76½ lbs. London cables £8 10s.

Tin Plate.—The market is quiet. The American Tin Plate Company quote $3.80 per box of 14 x 20 100-lb. Cokes, f.o.b. mill, equivalent to $3.99, New York. English cables are 11 shillings 7½ pence for Plates in Wales, showing an advance of 1½ pence.

It is reported that the Washburn-Crosby Company will soon commence the work of building the largest flouring mill in the world at Buffalo. It will rival anything in Minnesota or elsewhere, and will be operated by Niagara power. It is stated that 2000 horse-power will be required for the operation of the proposed mill. The erection of the mill may be looked upon as the initial step in the change of base of the flour mill industry of this country, and similar steps may be taken by other concerns which have been milling their grain in the West. Of late years the Niagara locality has been growing in favor with men engaged in this industry.

The fifth congress of the Chambers of Commerce of the British Empire opened at Montreal, Canada, on August 17. Lord Brassy, the president of the congress, made the opening address. He was followed by Lord Strathcona, the British High Commissioner. Mention of the name of Joseph Chamberlain brought forth great applause.

The New York Machinery Market.

NEW YORK, August 19, 1903.

While the volume of orders has not grown during the last week and immediate business is rather quiet in all lines, indications of a renewal of activity in the fall have increased considerably. This is vacation season, and members of the trade are giving the seashore and mountains more attention than they accord the business situation. Those who are still in the city talk of the yacht race in preference to machinery. But, on the whole, everybody is happy and in an optimistic frame of mind.

Reports received in the street from other sections of the country indicate that New York is about the dullest point in the country from a business view. This market is besieged with prospective business, however, and with the situation brightening up on all sides machinery merchants here are confident of better times in a business way when the good times of the summer pleasures have come to an end.

Reports from the West sound as though there never had been a letting up of business, and they speak of tremendous activity among the railroads, bright prospects for crops and activity on all sides.

Improvements are being made on the Southern cotton mills during the slack period incident to the high price of cotton. Great engineering projects are planned for the Central and Southwestern districts recently flooded, with a view of preventing a recurrence.

From Canada come reports of great industrial activity, and New England sees better conditions at hand. In connection with the latter statement our New England representative advises us that the machine tool builders in that section are feeling a good deal easier over the outlook of business than they were a month ago. The machine shops are not running as full as they were in the spring. The falling off in business has been generally rather greater than the usual summer depression. But now inquiries are coming in in unexpected volume, and much good business is in sight. Most machine tool men report collections as easy.

Although negotiations have continued between the General Electric Company and machinery merchants in the street, nothing definite has resulted during the last week concerning the large machinery purchases which are contemplated by the former concern.

The De La Vergne Refrigerating Machine Company, Locust avenue and 158th street, New York, are now in the market for a quantity of machine tools to be used in fitting out an extension to their plant. We are advised that they are seeking prompt deliveries. L. Block has the matter in hand for the company.

The Grand Trunk Railway system have decided upon a location for new car shops. Official announcement of the decision has not as yet been made, but it is generally believed that the work will be carried on at Barrie, Ont. The site which it is thought has been selected is just east of the old shops. W. D. Robb, Superintendent of Motive Power, whose office is at Montreal, is understood to have selected the site during his visit to Barrie several days ago. It will be recalled that announcement of the intention to construct new shops on a very large scale was made some months ago, but the work was held in abeyance, pending the selection of a suitable site. A. Butze is general purchasing agent of the Grand Trunk system, with offices at Montreal. Representatives of American machinery houses who have visited Canada recently and have looked into this matter state that extensive purchases of machine tools will be made in this country in connection with this project.

Rumors, which we have not had time to verify, state that the Pennsylvania Railroad intend erecting two steel car plants in the vicinity of Altoona, Pa. A plant for the production of steel cars is now in course of construction at this point, and the reports state that as soon as this is completed the proposed plants will be erected at a cost of about $1,000,000. It is also reported that large extensions to the machine shops at Altoona are contemplated.

Announcement is made that the Southern Railway have decided upon the expenditure of $300,000 for the enlargement of the shops at Spencer, N. C. J. T. Robinson is master mechanic at the Spencer shops and is working up the proposed extension with S. Higgins, mechanical superintendent, whose office is at Washington, D. C. J. P. Minetree of Washington is the purchasing agent.

J. F. Deems, general superintendent of motive power of the New York Central and affiliated roads, has just returned from a trip of inspection of the West Albany shops. It is said that while there he made arrangements for resumption of operations in connection with the building and equipment of new shops, and it is generally believed in the trade that this matter, which has been deferred so long, will now be carried into execution.

A short time ago the Standard Motive Power Company of Canal Dover, Ohio, attracted considerable attention in the trade by announcing extensive plans for the contruction of a plant. Contracts were awarded for some of the buildings and specifications for a large amount of machinery were sent out. This company are now in the hands of receivers on the petition of F. Wentz & Co., general contractors, of Canal Dover, who allege that the company are insolvent and unable to pay a claim of $4000 due for work performed and materials furnished. The company were organized about a year ago with a capitalization of $10,000,000, and were to manufacture locomotives according to the patents of Arthur P. Dodge. We are informed that the receivership was asked principally for the protection of the property, and a movement is now on foot to reorganize the company with about one-third of the original capital.

The Lehigh Valley Railroad Company have not as yet awarded contract for the cranes to be installed in their new shops at Sayre, Pa. It was expected that this matter would be settled last week, and representatives of the large crane building concerns were in New York for this purpose. This is one of the most important crane deals that has been up for some time, as the order will amount to about $75,000. The machine tool list for the Sayre shops has not been prepared as yet.

No purchases have been made by the Erie Railroad Company in connection with the specifications recently issued for about $100,000 worth of machinery to be placed in the various shops of the road.

The Singer Mfg. Company of 149 Broadway, New York, and Elizabethport, N. J., intend erecting extensive works in Germany. E. H. Bennett, the second vice-president of the company, has just returned from a trip abroad, where it is thought he made final arrangements for the location of the proposed plant. No information of an official nature is to be had at this time, but reliable advices from abroad state that the company intend purchasing their machinery equipment in this country.

A new German corporation known as Vereinegte Schuh Machinen Gesellschaft, which is said to be a German branch of the United Shoe Machinery Company of Boston, Mass., are preparing plans for the erection of a large plant in Germany. We are advised that it is the intention of the principals to purchase their machinery equipment in this country. The fact will be recalled that the United Shoe Machinery Company are building immense new shops at Beverly, Mass., and the theory of several members of the trade is that they will purchase the equipment for the German plant at the same time that they secure their machinery for Beverly.

David Townsend has resigned the position as general manager of the Gruson Iron Works, at Eddystone, Pa., and has established offices at 1103-1106 Penn Square Building, Philadelphia, Pa., as designing and contracting engineer. Mr. Townsend is now engaged in the construction and equipment of the new steel car plant of the Sterlingworth Mfg. Company, at Eddystone, Pa. Ground has just been broken for this plant, and the subject of equipment is now under advisement.

The National Steel Foundry Company of New Haven, Conn., who are purchasing a large amount of machinery for their new plant, have just closed on their cranes, giving the orders to the Niles-Bement-Pond Company.

Quotations on an axle lathe, punch and shears, cutting off machine, 600-pound steam hammer, wood working machine for heavy work, bulllozer and two 50 horse-power boilers are desired by Hans Olsen of the firm of Olsen & Horton, proprietors of the Novelty Iron Works, Punxsutawney, Pa. The machinery is for a new plant, 50 x 120 feet, which is to be occupied by a recently organized company for the manufacture of mine cars, and in which Mr. Olsen is the leading spirit.

The Lancaster Machine & Knife Works, Lancaster, N. Y., who are extending their plant, are looking for a small amount of machinery, including a slotting machine, planer, grinder, milling machine and speed lathes. W. J. Cant, the treasurer and manager of the company, is in charge of the work.

The patents, patterns, machines and materials belonging to the disk grinding business of the George Gorton Machine Company of Racine, Wis., have been purchased by the Diamond Machine Company of Providence, R. I., who intend manufacturing and selling the Gorton machines in connection with their own line.

The following machines are among the supplies required for the Western yards, bids for which will be opened September 1 at the Bureau of Supplies and Accounts, Navy Department, Washington:

Class 65. One standard gas machine.
Class 66. One combined wire stringer, feed and cutter.
Class 67. One tenoning machine No. 3.
Class 68. One two-sided sticker or molder.
Class 69. One power gang punching machine.
Class 70. One engine lathe.
Class 71. One sheet metal workers' spinning lathe.
Class 72. One emery grinder.
Class 73. One heavy sheet metal power bending break.
Class 74. One slip roll forming machine.
Class 76. One pan forming machine.
Class 77. One engraving machine.
Class 78. One steam engine driven ship plate bending roll.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until September 8 to furnish

at the United States Naval Academy, Annapolis, Md., a universal milling machine, shaper, metal planer, slotting machine, sensitive drill and tools. Proposals will be furnished by the Navy Pay Office, Baltimore, Md.

Arrangements have been made with the British engineering firm of Richardson, Westgarth & Co., Limited, by the Southwark Foundry & Machine Company of Philadelphia, Pa., whereby the former concern have acquired rights to build the Southwark blowing engines for the British market. It is understood in the trade that the English concern will extend their plant considerably, equipping it along the lines of the Philadelphia plant for this particular work.

The Jacobson Gas Engine Company, Warren, Pa., have been organized with a capital stock of $1,000,000, to manufacture the gas engines formerly manufactured and marketed by Charles Jacobson in connection with Struthers, Wells & Co. of that city. Until their own plant is in operation the engines will be built by several concerns, and the company are now prepared to install complete plants, paying special attention to large engines to be run on producer and blast furnace gas. It will be recalled that the Jacobson Machine Mfg. Company of the same city, and of which Charles Jacobson is also president, are erecting several large buildings and will require considerable new machinery. We are informed under a late date that the specifications for the equipment have not yet been made up.

The Reeves Engine Company, Trenton, N. J., have completed plans for a new foundry, which they will equip with modern machinery. Estimates are in for the building, which will be 64 x 127 feet, with wings at each end, 26 x 28 feet.

The Coe Brass Mfg. Company of Torrington, Conn., are adding to their power plant and have just placed orders with the Allis-Chalmers Company of 25 Broad street, New York, and Chicago, for a 22 by 44 by 42 inch and a 19 by 38 by 42 inch combined horizontal and vertical compound Reynolds-Corliss engine, and two air pumps and two jet condensers.

The contract for the engines to be installed in the new power station at the Museum of Natural History, New York, has been awarded by Charles L. Eidlitz to the Hooven, Owens & Rentchler Company, 39-41 Cortlandt street. The contract calls for two tandem compound Corliss noncondensing engines direct connected to 200 kw. generators. C. O. Mailloux is consulting engineer of this work.

Two nice contracts for complete power plant equipments have just been secured by the Washington Company of 39-41 Cortlandt street. They are for the Hanover Cordage Company of Hanover, Pa., and George L. Tomlinson & Son of Perry, N. Y. The engines will be of the Hamilton-Corliss type and the boilers will be furnished by the Franklin Water Tube Boiler Company of Troy, N. Y. The other accessories will be purchased from various manufacturers.

The American Road Roller Company, 156 Fifth avenue, New York, recently incorporated with a capital stock of $450,000, have purchased the road roller business of W. C. Oastler. They have also purchased the plant of the Conger Mfg. Company, at Groton, N. Y., where they will continue the manufacture of steam road rollers, traction engines, gasoline motors, stone crushers, street cleaning and other machinery. The Conger works were completed in 1892 and consist of a boiler shop, foundry, machine shops, brass foundry, wood working shop, saw mill and large warehouse. The Chicago officers of the company are located in the Chamber of Commerce Building. W. C. Oastler is president, who, with Ben Conger, Jay Conger, Dr. F. R. Oastler and Charles Cranford, compose the Board of Directors.

The Interborough Rapid Transit Company have contracted for an escalator to be installed at the Thirty-third street station of the Sixth Avenue Elevated Road. The escalator will be placed on Broadway just north of Thirty-third street and will carry passengers direct to the down town station. A foot bridge will extend over the tracks to the up town station. The contract was awarded to the Ot's Elevator Company.

J. E. Conaut & Co., auctioneers, of Lowell, Mass., have issued a comprehensive catalogue describing the properties of the Atlas Tack Corporation to be sold at public auction from August 25 to August 28, inclusive. The properties to be sold include the plants formerly owned by the Albert Field Tack Company and the Taunton Tack Company at Taunton, Mass.; the American Tack Company at Fairhaven, Mass., and Loring & Parks at Plymouth and Duxbury, Mass. A great quantity of machinery is to be sold.

About one-third of the concrete and brick lining of the tunnel of the Canadian Niagara Power Company is in place. This lining is being made with a concrete back and brick face, the arch being wholly of brick. In all about 2,000,000 brick will be used. At the portal of the tunnel the second-class masonry has been about completed in the foundation of the parapet wall. It will be impossible to complete the work at this point this season, because it will be impossible to work there after November, possibly not as late as that, owing to the ice formation from the spray cloud.

PERSONAL.

J. Stephen Jeans, editor of the *Iron and Coal Trades Review*, London, arrived in New York August 14, en route to Canada. He will return to the United States early in October.

Alva C. Dinkey was elected president of the Carnegie Steel Company at a meeting of the Board of Directors, held at Pittsburgh, Pa., August 13. He succeeds W. E. Corey, now president of the United States Steel Corporation. A new office, that of chairman of the Board of Directors, was created, and James H. Reed was elected to this position. One of the important acts of the new president was to appoint as his successor in the general superintendency of the Homestead Steel Works, A. E. Hunt, general superintendent of the Duquesne Steel Works. Homer D. Williams, assistant to Mr. Dinkey at Homestead, was made general superintendent of the Duquesne Steel Works, succeeding Mr. Hunt.

P. J. Tormay, superintendent of the Trotter Works of the H. C. Frick Coke Company, in the Connellsville region, is home from Europe. While abroad Mr. Tormay made a special study of conditions in the coal and coke regions of England. In the Durham coke region drawers get 50 cents an oven, while here they get $1 an oven, and draw two or three ovens a day. The miners there get from $1.50 to $1.75 a day, while here they get from $2.25 to $2.50 a day.

J. Edward Springer, Martins Ferry, Ohio, has been appointed superintendent of the bar and plate mills of the Portsmouth Steel Company of Portsmouth, Ohio.

Edgar S. Cook, president of the Warwick Iron & Steel Company, Pottstown, Pa., sailed for Europe on the 15th, accompanied by Mrs. Cook.

Charles Kirchhoff, editor of *The Iron Age*, sailed for London on the "Mesaba" on August 15. He will attend the meeting of the Iron and Steel Institute at Barrow.

C. A. Chandler has resigned his position as superintendent of the Washburn shops of the Worcester Polytechnic Institute, and William W. Bird has been made head of the entire department of mechanical engineering of the institute, including the Washburn shops. This appointment gives to Professor Bird a greater field than has been accorded his predecessors, as formerly the shop management was distinct from the department of mechanical engineering. He will have an assistant to look after the direct management of the shops.

George Mesta, president of the Mesta Machine Company of Pittsburgh, Pa., sailed for Europe recently for an extended visit.

S. T. Wellman, C. Ernst and F. W. Moller of the Wellman-Seaver-Morgan Company of Cleveland, Ohio, have returned from Europe, where they are reported to have closed an important contract for the remodeling of an extensive British iron and steel plant.

George Westinghouse arrived from Europe on Tuesday by the North German Lloyd steamer "Kaiser Wilhelm II."

OBITUARY.

Ephraim J. Aulls, proprietor of a foundry and machine shop at Bath, N. Y., was drowned last week in Lake Keuka, N. Y., aged 75 years.

Dan Parmelee Eells died at his home in Cleveland, Ohio, on August 14. Mr. Eells was born at Westmoreland, Oneida County, N. Y., April 16, 1825. He was identified with the Commercial National Bank of Cleveland, as vice-president and president, from its organization in 1865 until 1897, when, on account of failing health, he retired from active business. At the time of his retirement Mr. Eells had been the longest in service of any bank officer in the State of Ohio, and was widely known by bankers throughout the country. During a long life of varied activity Mr. Eells was connected with many enterprises of national as well as local importance.

Labor News.

The success of the New York Metal Trades Association in filling the places of the striking machinists in the marine shops in the vicinity of New York has stirred the strikers to drastic measures. At a number of the shops the strikers have resorted to violence and intimidation in an endeavor to compel the nonunion men to abandon their places. This work has been met with sweeping injunctions issued against the unions in the instances of the Burlee Dry Dock Company, Morse Iron Works and W. & A. Fletcher Company strikes. Threats have finally been made by the unions to call all of the employees of the various yards out in sympathetic strikes.

Henry C. Hunter, secretary of the New York Metal Trades Association, in discussing the threat of the marine trades to order a general sympathetic strike in the shipyards in support of the machinists, said:

"The association believes that there will be no sympathetic strike by the labor organizations with which it has contracts containing the express stipulation 'that there shall be no sympathetic strikes called on account of labor disputes.'

"This clause is contained in the contracts with the Brotherhood of Boiler Makers and Iron Ship Builders, the helpers' division of that brotherhood, and the Marine Steam Fitters. The contracts with the blacksmiths and their helpers, while not expressed in the same words, contain a stipulation that there shall be no strikes during the term of the contract.

"At the time of the conference on the subject of the machinists' demands, held May 25 last, between a committee consisting entirely of business agents of the machinists and a committee of the Metal Trades Association, the conferees were unable to agree on the question of wages only. They did agree, however, that there should be no sympathetic strikes called."

Mr. Hunter added that in the present condition of trade the yards in most cases would save money by closing for a while.

Besides the trades enumerated by Mr. Hunter in the shipyards, there are the pattern makers, coppersmiths, painters, ship joiners and riggers.

There are indications of weakening on the part of the few unions which have been holding out in the building trades' strike in New York City.

President Charles L. Eidlitz of the Employers' Association predicts that the present building trades trouble will be over September 1.

"The Portable Hoisting Engineers," he says, "are still giving trouble by refusing to hoist iron, but a new union has been formed under the arbitration agreement, called the Hod Hoisting Engineers' Union of Greater New York. It has 90 members, including 60 from the old union, and there are 100 applications for membership besides. The other new unions are supplying all the men needed in their respective trades. There are now 862 housesmiths and bridgemen at work."

Mr. Eidlitz said that an employers' association had been formed in Boston on similar lines to the association of Manhattan, and the unions took the initiative regarding a plan of arbitration, which has been agreed to.

At a conference held between a committee of the Machinists' Union and the manufacturers in the offices of the Lloyd, Booth Company, in Youngstown, Ohio, last week, it was arranged that the men would continue at work pending a settlement of their demands. Some time ago the machinists in Youngstown demanded an advance of about 15 per cent., and the employers offered a straight increase of 10 cents per day. The men have since modified their demands, and it is probable a settlement of the matter will be reached at a very early date.

A serious labor trouble took place on Sunday morning, August 16, between striking machinists and about 25 nonunion men who took their places in the Riverside plant of the National Tube Company, at Wheeling, W. Va. The machinists have been out on strike for several weeks, and about 20 men were imported to take their places. The men have been more or less molested, and on the morning of August 16 a riot took place, in which a large number of shots were fired, but none of the men were seriously injured.

Damage suits against labor unions and members of unions aggregating $66,000 were filed in Chicago courts on August 14. John M. Stiles, painting contractor, who alleges that his business has been ruined by unions, sued the Painters' District Council for $30,000. The Kellogg Switchboard & Supply Company filed two suits, each for $15,000, against unions involved in the strike on the plant. Six young women, employees of the Kellogg Company, sued eight women for slander and libel, each case being for $1000 damage.

The strike at the Pennsylvania Engineering Works, New Castle, Pa., has been settled, and the 600 men are at work again.

After 11 weeks' struggle, the strikers who were locked out by the Eastern Shipbuilding Company at New London, Ct., because they demanded a nine instead of a 10-hour day, have voted to return to work at the old schedule. The strikers became short of funds and deemed it advisable to give up the fight. The Shipbuilding Company has promised to give employment to all strikers who apply for jobs.

Demands made last April by the molders and coremakers of Trenton, N. J., for a nine-hour day without reduction in wages have been granted. The settlement was effected by a conference of First Vice-President W. A. Valentine of the Iron Molders' Union and Business Agent George B. Kemp of the Core Makers' National Union and Commissioner John S. Penton of the National Founders' Association, together with the employers. The conference extended over a period of two hours, the employers stipulating in the agreement with the union that no further demands be made by the former until after June 3, 1904. By the settlement the iron molders will receive $2.75 per day of nine hours and the core makers will receive $2.50 per day of the same length.

Water Power on Chicago Drainage Canal.—The Commissioners of the Sanitary District of Chicago are to receive on October 7 bids for the development of the water power of the canal, the estimated cost of which is $2,750,000, to be completed within two years. The plans provide for the development of 30,000 horse-power at Lockport. The drainage channel is to be extended 1 8-10 miles south of the town, and a power house containing seven electrical dynamos of 5000 horse-power; each will be erected near the present controlling works. Each dynamo will be driven by three pairs of turbine wheels, connected on a horizontal shaft. The head of water provided at the power-house to supply the energy is 34 feet. The tailrace will extend 1½ miles south of the power house, to connect with the lower basin at Joliet. A lock will be constructed near the power house, with a view of preserving the navigable features of the drainage channel.

The German Machine Tool Trade.—The *Deutsche Industrie Zeitung*, in its issue of July 17, 1903, refers to the proceedings at a convention of German machine tool makers. Reports of those present went to show an increase of business in the empire; but the orders were not large enough nor the prices satisfactory. The orders from the Government were not nearly as large as desired. Complaint was made against the custom of the large iron mills of contracting for machinery only on condition that part payment be made in the iron or steel products of the mills. Another evil complained of is the custom of the iron or steel mills making their own conditions when contracting, instead of following, as formerly, well established customs. In the matter of contracts in which it is provided that the tool makers take steel or iron from the mill, great abuses have crept in. The contract provides sometimes that fully 50 per cent. of the bill be paid in material. Inasmuch as the greater part of the cost of a machine lies in the labor expended on it, and the most of the material is cast iron, the demand of the mill to be allowed to pay for it in its products seems unfair and unjust. It was thought that little can be done in individual or isolated cases, but that a combination of the machine builders might effect a reform.

Iron and Industrial Stocks.

The change for the better in speculative sentiment in the last week has continued, and most of the industrial stocks made sharp gains as compared with the prices then ruling. The market has shown a decidedly healthy tone, and it is now believed that the great liquidating movement is over. The advance during the week was assisted by dividend expectations in some stocks which have not yet paid anything to their holders and reports in other cases of possible fresh consolidations. It is denied, however, that any negotiations are contemplated for the purchase of the Colorado Fuel & Iron Company by the United States Steel Corporation. A rumor to this effect is stated to have had considerable influence in advancing the price of Colorado. The following quotations show the lowest and highest prices from Thursday of last week to Tuesday of the present week: Can, common, $4⅝ to $5⅝; preferred, $38½ to $45; Car and Foundry, common, $32¾ to $34½; preferred, $82 to $84¼; Locomotive, common, $18 to $20½; preferred, $84½ to $85; Cambria Steel, $21¼ to $22½; Colorado, $45 to $53½; Crucible, preferred, $71¾ to $73¼; Pressed Steel, common, $39 to $45⅝; preferred, $81 to $82; Railway Spring, common, $24 to $26; Republic, common, $12 to $12¾; preferred, $66 to $68; Sloss-Sheffield, common, $35⅜ to $36; Tennessee, $39 to $47½; Steel, common, $23¼ to $24¾; preferred, $71 to $73⅞; the new Steel 5's, $78⅜ to $80. Some reaction occurred on Wednesday morning, and prices at noon were as follows: Car & Foundry, common, $34; Locomotive, common, $19; Republic, preferred, $67; Sloss-Sheffield, common, $34; Tennessee, $44; Steel, common, $23⅞; preferred, $72½.

The National Enameling & Stamping Company report for the year ended June 30 gross profits of $2,244,472, a decrease from the previous year of $322,346. Operating and general expenses decreased, and were $487,669, a decrease of $90,700, and net profits were $1,756,783, a decrease of $231,646. Total charges, including organizing expenses and sums written off, amounted to $1,442,860, an increase of $123,732, leaving after dividends a surplus of $313,923, a decrease of $355,368. Profit and loss surplus at the end of the year was $1,593,630. The general balance sheet at the close of the year read as follows:

Assets.

	1903.	Increase.
Real estate, plant, tools, good will, &c.	$23,324,165	$362,856
Investments	10,000	10,000
Balance of expenses of organization	.....	*28,500
New catalogues	1,485	*5,232
Materials and supplies	4,247,460	*235,996
Accounts and bills receivable	895,239	110,865
Prepayments	60,105	21,629
Cash	309,806	*117,828
Totals	$28,848,260	$117,795

Liabilities.

Capital stock	$23,838,400	.....
First mortgage gold bonds	2,249,000	*$86,000
Accrued interest	37,483	*1,434
Sundry creditors	328,389	*108,694
Dividends due	301,358	.....
Reserve account	500,000	500,000
Profit and loss surplus	1,593,630	*186,078
Totals	$28,848,260	$117,795

* Decrease.

The annual meeting of the National Steel & Wire Company will be held September 8 at Portland, Maine.

The report is circulated that the first year's dividend on American Can preferred will be at the rate of 5 per cent. It is said that the disbursement will be made semiannually, 2½ per cent. being declared at the meeting next month, payable November 1.

Dividends.—The Barney & Smith Car Company, Dayton, Ohio, have declared the regular quarterly dividend of 2 per cent. on the preferred stock, payable September 1.

The Allegheny Heating Company of Allegheny, Pa., suppliers of natural gas, have declared the regular quarterly dividend of 3 per cent. and an extra dividend of 3 per cent., payable August 25.

The American Steel Foundries have declared the usual quarterly dividend of 1½ per cent. on their preferred stock. Transfer books close August 24 and reopen September 16. The annual meeting of the stockholders will be held on September 15.

The latest statistical estimates for the German Empire place the population on July 1, 1903, at 58,549,000, against 57,708,000 and 56,862,000 on July 1, 1902 and 1901, respectively. From these figures, it appears that the population has increased 841,000, or 1.46 per cent., in the last year. In the last ten years the population has increased 7,800,000; in the last 20 years 12,500,000, and since the formation of the German Empire, 17,500,000.

Trade Publications.

Bridges and Buildings.—A very handsome catalogue has been prepared by the Berlin Construction Company, describing a few classes of work which they have designed and erected, and presenting a bridge or building typical of a certain class. These are introduced to enable parties who have in mind to build similar structures to get some new ideas relative to the construction they have in mind. The company make a specialty of designing complete plants, more especially manufacturing buildings of steel frame construction, of which they have built some of the finest examples in the United States. In addition to their facilities for manufacturing steel work for buildings and bridges of all descriptions, they are in position to contract for the design and erection of complete plants ready for the machinery. They have also had a large experience in steel-concrete construction. Unusually perfect half-tone engravings show many typical buildings and bridges both during construction and after completion

Fire Brick and Various Refractories.—A pocket book, leather bound, with flap cover, has been prepared by the Harbison-Walker Company of Pittsburgh. Full and complete information is presented concerning their silica, magnesia, chrome and fire clay brick, and various refractories. The present blast furnace practice—closed top furnaces, high pressure hot blasts, &c.—makes it more essential than ever before that the lining be the best obtainable. At an early period, and continuously to the present time, this company have paid special attention to this branch of the business, the result being a tonnage of metal per lining not thought of as possible previous to the records recently obtained. Not the least valuable portions of the book are drawings showing the methods of lining standard furnaces.

Branch Condenser and Oil Eliminator. — A pamphlet by the National Oil Burner & Equipment Company of St. Louis, Mo., deals with their new condeser, which is usually placed on the dash in front of an automobile. The exhaust steam from the engine enters the condenser where the oil eliminator is located and blows through the eliminator, which is a chamber formed in the head of the condenser and which is filled loosely with cotton waste or excelsior. In this way the steam is purified before it enters the copper tubes of the condenser, thus avoiding the usual trouble of the oil depositing in the same, where it cannot be removed without considerable inconvenience. The condensation, purified and ready for the boiler, is drained from a ¼-inch connection on the foot of the header. The cotton waste can be easily replaced when necessary.

The Heating and Ventilating of a manufacturing establishment are covered by a pamphlet by the American Blower Company of Detroit, Mich. Their A B C fan system is adapted to the heating of every class of large buildings, and in none do its peculiar advantages appear more strongly than in factory buildings and kindred structures. The apparatus consists of a disk or steel plate fan and a heater coil of 1-inch steam pipe encased in a sheet steel jacket, and occupies, as a rule, no larger floor space than 6 feet square.

Air Blast Transformers are described in the last bulletin by the Westinghouse Electric and Manufacturing Company of Pittsburgh. The method of cooling those is by a forced blast of air furnished by a blower. One blower generally supplies a number of transformers in the same station, and the transformers are usually placed above an air chamber in which a pressure is maintained slightly above that of the surrounding air. The blower may deliver air directly into this chamber, or, if more convenient, may be located at a distance from the transformers and deliver into a conduit leading to the chamber. The iron and copper are cooled separately. The air for cooling the coils passes up through the transformer between the coils, which are held apart by spacing strips, and discharges through an opening at the top. The air for cooling the iron passes from the lower housing through a damper at one side and then horizontally through ventilating ducts spaced at frequent intervals in the iron.

Milling and Boring Machines.—A handsome catalogue has been issued by the Beaman & Smith Company of Providence dealing with their metal working machine tools, especially milling and boring machines. Their combined vertical and horizontal spindle milling machine has two spindles, one vertical, the other horizontal, in heads with adjustment in the saddles, which have horizontal and vertical movements respectively on an overhanging arm and upright. The spindles have tapered ends for face milling cutters, also taper holes for cutter shanks and arbors. With them any known form of cutter can be used to advantage. The table is provided with automatic feeds in either direction, arranged so as to maintain the desired rate at any spindle speed, which is very important.

A very complete catalogue has been received from the Charter Gas Engine Company of Sterling, Ill., describing their stationary and portable gas and gasoline engines. These engines are extremely simple in construction, and economical and reliable in operation.

An attractive bulletin by the Stromberg-Carlson Telephone Manufacturing Company, Rochester, N. Y., describes their apparatus for meeting the most exacting requirements of perfect communication at all times between the various departments of companies requiring reliable and efficient service.

HARDWARE.

THERE are doubtless some business men, both among the makers and distributers of goods, who make little attempt to take a broad view of the situation so as to form an intelligent opinion as to the course of trade. They are content to take things as they come, without much attempt at forecasting changes which may take place in commercial conditions. Such business men, if this term may be applied to them, are obviously lacking in the spirit which is necessarily characteristic of the successful merchant or manufacturer, as the case may be, with whom there is a constant endeavor to keep in touch with trade tendencies and conditions and to observe all the signs of the times, especially so far as they bear upon the market and the changes which are constantly occurring. At the present time the situation is certainly sufficiently complicated and presents enough problems, many of which are almost entirely new, to make the study of the business situation interesting. The perplexity attending financial questions, with the lighter or darker shades which are apparent in Wall Street, and the more normal conditions which prevail throughout the country at large; the facts in regard to crops and agricultural products generally, which have so much to do with the country's welfare, and especially the conditions in one's own territory; the tendency of prices in the raw material and the finished products, the influence of consolidations in their weakness and their strength; the changes which are taking place in the making, and more especially in the distributing, of goods; the prosperity of the various classes, including labor and the commercial and agricultural interests, upon the activity and well being of which the continuance of satisfactory business depends; the results which are to be expected from efforts to control business matters, whether through associations which grapple with trade problems and aim at the advancement of the interests of their membership, or the more formal business compacts in the line of combinations, pools or consolidations, which endeavor to secure control of the production and prices of certain lines of goods; the measure of disturbance, which is to be expected from political agitation, whether in connection with the Presidential election or the discussion of tariff questions; the protection of the rights of labor as well as capital against the encroachments of unions, which are so often the enemies of both, together with the broader outlook into foreign fields, with their varied conditions of prosperity and the possibility of disturbance through war, or the mimic war of tariffs, these are some of the questions which must be considered in forming an intelligent view as to the outlook for business, even in the near future. The complexity of the problem and the uncertainty attending some of the influences which enter into it invest the subject with a peculiar interest and fascination, which correspond with its importance in a business way, as a course of action based upon an important misjudgment will be followed by an inevitable penalty.

In connection with this view of the market as a whole each manufacturer and merchant will recognize the prime importance of looking carefully and candidly at the influences which bear upon his own immediate interests, and consider making improvements in his methods wherever possible. There must be a frank recognition of the strength or weakness of his position, a correct estimating of the seriousness of competition, new or old, and watchfulness for changes which can be made in any department of his establishment. There should be the attempt from time to time to look impartially and critically at his business very much as it would present itself to an outsider who had for the time being an inside view of all the facts and conditions. In this way he would presumably discover much to commend and continue, and something to condemn and improve upon. If these observations were made without prejudice or partiality to himself, which in such a case is folly, the result would probably be to furnish him with a basis for changes in his way of doing things which should make his business more profitable and the direction of it more stimulating and interesting. All this would, of course, be directly connected with the study of the conditions which have to do with the volume and aggregate of his trade in his own territory. In these days of business development and stress there is certainly enough to engage the best thought of all who endeavor to make a respectable place for themselves in the commercial world, and the vacation period draws to a close with a call for renewed attention to the great questions which underlie a successful business career. Some will consider the problems perhaps seriously and show themselves deficient in the energy which would put the result of their consideration into effect. Others will doubtless go along in the same humdrum way which has characterized their operations up to this time, and so continue at a snail's pace until they are left behind in the race. Many, it may be hoped, will correctly size up the situation and recognize and improve their opportunities.

Condition of Trade.

There continues to be a hesitancy among the trade about ordering freely, but in certain lines at least there is more demand and indications of a resumption of normal activity. Some lines which are recognized as low in price are commanding orders on a more liberal scale. On the whole, there seems to be a hopeful feeling, and merchants and manufacturers are making preparations for a good season. There is still a slight softening in prices of certain lines, and manufacturers are sometimes shading quotations under pressure. The market, however, on the whole is remarkably steady, and material reductions in prices are not anticipated in the near future. With the continuance of prosperity throughout the country there should be a large and profitable trade. Labor agitations, which prevail in so many sections, are a serious menace to business, but while the contest is not always going in favor of the broad and just principles which can conserve the interests of both the capital and labor classes, there appears to be a tendency successfully to resist arbitrary and unreasonable dictation. In spite of such disturbances the indications point to a good amount of building and the consequent consumption of lines directly affected, and the employment of mechanics, whose wages swell the currents of trade. There is also every indication that the agricultural classes will enjoy a season of at least average prosperity, when the size of the crop and the prices realized are taken into consideration. The steadiness and gradual expansion of export business to which we have repeatedly called attention still continues. In the present state of trade manufacturers are glad to avail themselves of the opportunity to get something of a supply of goods into their warehouses and to clean up their order books. Some of them are, however, still behind their orders, although working their factories at high pressure. The reports which are coming in from traveling salesmen are generally very satisfactory.

Chicago.

(By Telegraph.)

A very quiet week has been experienced by both jobbers and manufacturers, the largest local interests reporting trade somewhat less than the volume of business a year ago. However, the comparison is within a very active line and thus is only to be expected. It is significant that the largest manufacturers of Nails and Wire report that the tonnage thus far in August is considerably in excess of the orders booked at this time last year, and they are meeting difficulty in making shipments because of the lack of cars at some points. One feature worthy of note is that the orders being received from jobbers cover nearly the entire list, indicating that stocks are low, and in not a few cases requests are made that a portion of the shipments be anticipated. The demand for these staple goods, while improving in nearly all sections, is especially good from the Southwest. It is confidently expected that business will be unusually active in September, the present conservative spirit giving place to a more confident feeling as harvesting operations are finished. The demand for heavy goods, such as Bars, Structural Shapes, Shafting, &c., has improved slightly, but with keen competition from other cities in nearby territory concessions have been made, especially on Bars and Shapes. Black Sheets are quiet and are not well sustained, but Galvanized have developed firmer tone. Manufacturers' agents are complaining of the difficulty of securing large orders for Builders' Hardware, Shelf Hardware and general jobbing lines, notwithstanding that in many cases low prices have been made. In Builders' Hardware the city trade is especially quiet, but there is some figuring on apartment building, and the trade is interested in contracts which will soon be let for the Pennsylvania depot at Washington, D. C.; a large bank building at Winnipeg, a Masonic building at Detroit, the Pierce Building and other smaller structures at Chicago. By those well posted the belief is expressed that as a result of the readjustment which is now taking place in prices of Builders' Hardware fine goods will be advanced, and advices are expected from the East at almost any moment. Local jobbers report fair shipments of fall goods, including Coal Hods, Stove Boards, Pipe, Elbows, Lanterns, Axes, Ammunition, Scoops and Corn Huskers. Some late orders are also being received from the Northwest for Hay Forks where haying is late. The abnormal prices current for cotton are reflected in the 20 per cent. advance in the price of Cotton Window Cord. Cord is especially scarce in this market, but one or two jobbers report having a fair supply. There is some difference of opinion in regard to the prices of Axes, some agents reporting that an advance of 20 per cent. has been agreed upon, but no announcement has been officially made. Shot has been advanced 10 cents per bag during the week, and some manufacturers of common augur bits have advanced prices, but this is said to have been to discourage trade temporarily by those who have secured satisfactory orders. Other manufacturers are selling at previous prices. There has been some little increase in the demand for Cutlery. There is a moderate trade in Enameled Goods and other Kitchen Utensils, Laundry Goods and Edged Tools. Jobbers are displaying some interest in Steel Goods, prices for which it is expected will be made early in September, although some jobbers seem to be under the impression that the meeting will be held this month. Local Hardware jobbers are interested in reports from the Pacific Coast, which, it is claimed, reflect upon the local bidders on Indian supplies. Among the contracts recently placed were included small lines of Hardware as well as other supplies, and the Coast insinuations against Chicago merchants are strenuously denied.

St. Louis.

(By Telegraph.)

Activity of trade is the all important and satisfactory feature in local Hardware jobbing circles. The demand from dealers in all territory for fall goods gives great promise, and jobbers seem sanguine of a record breaking volume of orders.

Cleveland.

The W. Bingham Company.—We have nothing special to report at this time. A good volume of fall business is coming to us, and the outlook for the balance of this year is very encouraging. Our salesmen are sending in good well assorted orders, and there is quite a large business coming to us through our mail department.

We have a great many inquiries for building material of all kinds. Merchants are sharply looking after their home trade and order liberally, keeping their stocks well assorted. With the steady consumption of Hardware, and with the present outlook for good crops, we see no reason why our hopes in regard to fall business cannot be anticipated with surety of realization.

Nashville.

Gray & Dudley Hardware Company.—The demand for such Hardware as is usually sold at this season of the year was never better in August than it is to-day. We notice the orders cover a pretty general assortment of fall Hardware, especially Cutlery, Guns and Sporting Goods. This is an indication that our customers consider the country prosperous.

The wheat crop in this section was light, being not over a half crop, but all other crops promise to be most excellent. The early corn is now assured, and a better crop was never grown in this section. Hay and stock peas, which are raised largely throughout this country, are in splendid condition.

If the bankers of the country have at last drawn a line of distinction between the gamblers on Wall Street and the legitimate business interests of the country, which seems to be the case, we see no reason why we should not have as fine trade this fall as the country ever enjoyed.

Portland, Oregon.

Corbett, Failing & Robertson.—Harvest being under way in many sections of the Pacific Northwest, business perhaps is not quite as brisk as it might be. However, there is no complaint, as these conditions are expected to prevail at this season, and our dependence for fall trade is on the outcome of harvesting operations. Besides harvest drawbacks, the lumber business is not as active as it was. Of course, the Hardware trade feels at once any quietness in that line. The summer so far has been all that could be wished for, either on the score of health, pleasure or for work. Buildings are being rushed both for business and residences, so that mechanics and laborers of all kinds are in great demand, with high wages being paid. There is little change in prices, which are held down to a close margin of profit. Collections are fair for the season.

Louisville.

Belknap Hardware & Mfg. Company.—The market shows fair evidences of strength. While there was a halting movement in buying when Wall Street seemed to be in the doldrums, this did not continue, for it promised to be too expensive to whoever might indulge in it. With railroad earnings at a maximum, with construction going on freely in both town and country, with mines being pushed to their capacity and the agriculturist finding full prices for all of his products, it seems absurd for the business world to dump itself into a hole and endeavor to pull the hole in after it. The railroads are still overcrowded with business; deliveries are delayed by reason of lack of equipment and transportation and terminal facilities. People want more goods than can be moved, and are willing and ready to pay for them. Country banks are stuffed with money. Altogether, it seems that there was no excuse for the period of distrust except that people felt the time was due for the pendulum to swing the other way. Not that it was ready to swing or that it ought to swing, but they felt that the period of prosperity we had been enjoying was too good to last, and that they have undertaken to construe every little zephyr of doubt which blew, for a prelude of hurricane which would overturn values and put us all in the dumps.

We incline to the belief that the difficulty within 60

days will be to get goods, and we have not hesitated to advise the laying in of stocks early and liberally. To give proper permanence and confidence, however, we must all be virtuous and do the right thing. We cannot expect to indulge in extravagances and not have our head put under the pump sooner or later. If the great company, who stand for the iron and steel business of the country, in their name and enterprise, will follow this line, retire more of their bonds than they have agreed to, and if they will withhold dividends on the common stock until their equipment shall be in the best possible shape and their methods the most approved, we shall see confidence given to all worthy industrials and readers of *The Iron Age* in particular would point to this organization as a sample of what the iron and steel men can do when they set about it in good earnest.

Omaha.

LEE-GLASS-ANDREESEN HARDWARE COMPANY. — The wholesale trade of this region continues to enjoy a satisfactory measure of activity. No noteworthy features have developed to mark any material changes from previous reports. Advices from traveling salesmen and reports by visiting merchants who have been present in the market during this month all tend to substantiate the statement that the country tributary is in a very prosperous condition, and as long as the present status of affairs continues little fear need be entertained of any adverse changes. The general business policy appears to be to exercise caution in the purchase of goods and to so engineer business operations that the least possible loss may be sustained should reductions be made from the present scale of value.

NOTES ON PRICES.

Wire Nails.—The demand continues moderate, with prices well maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$2.00
Retailers, carload lots	2.00
Retailers, less than carload lots	2.15

New York.—Local conditions remain unchanged regarding demand and prices. Requirements are for small lots, but are continuous. The market is firm at the following quotations: Single carloads, $2.20; small lots from store, $2.25 to $2.30.

Chicago, by Telegraph.—While there has been no marked improvement in the demand for Wire Nails there has been a fair trade for this season of the year, most satisfactory orders coming from the Southwest. There is reason to believe that a liberal increase in business will be experienced early in September, and those who are forehanded will doubtless place early orders, as the signs indicate a renewal of the car shortage, which will doubtless interfere with shipments. The market has continued steady, prices being unchanged at $2.15 to $2.20 for carload lots, f.o.b. Chicago. Broken cars sell at 5 to 10 cents higher. For galvanizing 75 cents per keg and for tinning $1.50 extra per keg is charged.

St. Louis, by Telegraph.—Demand shows improvement, and in small lots from store jobbers quote $2.35.

Pitsburgh.—Demand for Wire Nails has shown some improvement in the last few days, and outlook for a good fall trade is regarded as very bright. The trade are buying conservatively, fearing a reduction in prices, but this is not likely to occur, as the leading interest has the situation well in hand. Based on present prices of Billets, Wire Nails cannot be regarded as too high. Prices are firm, and we quote $2 in carloads to jobbers, $2.05 in carloads to retailers and $2.15 in small lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days. For galvanizing Nails 75 cents per keg is charged and for tinning Nails $1.50 per keg extra.

Cut Nails.—There is a fair demand, which keeps mills employed to a considerable extent. Quotations are as follows: $2.15, base, in carloads, and $2.20 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination; terms 60 days, less 2 per cent. off in 10 days.

New York.—The requirements of the trade continue moderate, with prices well maintained. Quotations for carloads and less than carloads are as follows: Carloads on dock, $2.29; less than carloads on dock, $2.33; small lots from store, $2.40.

Chicago, by Telegraph.—There has been a very slow movement in this market, but all orders received are promptly filled, official prices being unchanged on the basis of $2.30 in carload lots and $2.35 for less than carload lots for Steel, Chicago. Iron Nails are held at $2.45 to $2.50 per keg from store.

St. Louis, by Telegraph.—Present requirements are in moderate volume. Quotations remain unchanged. Iron at $2.55 and Steel at $2.40 in small lots from jobers' stock.

Pittsburgh.—There is a moderate demand for small lots only, and the mills are making prompt shipment. Steel Cut Nails, $2.15, base, in carloads and $2.20 in less than carloads; Iron Cut Nails, $2.25, base, in carloads and $2.30 in less than carloads, plus freight in Tube Rate Book to point of destination, 60 days, less 2 per cent. off in 10 days.

Barb Wire.—New business continues light, but large stocks are being accumulated by mills in anticipation of a heavy demand in the fall. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$2.30	$2.60
Retailers, carload lots	2.35	2.65
Retailers, less than carload lots	2.45	2.75

Chicago, by Telegraph.—The tonnage on the books of the Wire mills is somewhat in excess of this time a year ago, but new business is still only moderate, buyers being especially conservative, but indications point to an early revival of trade and prices have been well sustained. Galvanized Wire is selling on the basis of $2.75 to $2.80 in carload lots, and Painted at $2.45 to $2.50, the outside price being to retailers. For small lots 5 to 10 cents extra is charged. Staples in carload lots sell as follows: Polished, $2.30 to $2.35, and Galvanized, $2.70 to $2.75, the outside price being to retailers.

St. Louis, by Telegraph.—The recent increase of business in this department has been quite marked, and the fall demand, it is thought, will be large. In small lots jobbers quote Painted at $2.65 and Galvanized at $2.95.

Pittsburgh.—There is some improvement in demand for Barb Wire, and buying is mostly for small lots, but the mills anticipate a heavy fall business. Prices are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days: Painted, $2.30; Galvanized, $2.60, in carloads to jobbers; Painted, $2.35; Galvanized, $2.65, in carloads to retailers; Painted, $2.45; Galvanized, $2.75, in small lots to retailers.

Smooth Fence Wire.—There is a noticeable falling off in the volume of orders, and requirements are usually confined to small lots. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.90
Retailers, carloads	1.95
Less than carloads	2.05

The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base.	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago, by Telegraph.—While the volume of business has fallen off somewhat it is still beyond expectations, while some difficulty is experienced in making shipments. The market is firm and a confident tone prevails. Prices remain steady, as follows: Nos. 6 to 9, $2.05 to $2.10 in carload lots on track, and $2.15 to $2.20 in less than carload lots from store; Galvanized, 30 cents extra for Nos. 6 to 14 and 60 cents extra for Nos. 15 and 16.

St. Louis, by Telegraph.—A considerable volume of trade rules in this department of the Wire market. Jobbers quote No. 9 at $2.35 and Galvanized at $2.65.

Pitsburgh.—Demand is better than for some time. Western consumers having placed some good sized con-

tracts recently. Prices are firm, and are as follows: Plain Wire, $1.90, base, for Nos. 6 to 9 in carloads to jobbers, $1.95 in carloads to retailers and $2.05 in small lots to retailers; Galvanized, 30 cents extra for Nos. 6 to 14 and 60 cents extra for Nos. 15 and 16.

Cordage.—The Rope market continues without any marked change in conditions which have ruled for the past two or three weeks. Demand is considered fair for the season. Quotations, on the basis of 7-16 inch and larger, range with different manufacturers as follows: Sisal, according to quality, 8¼ to 10 cents; Manila, 11½ to 12 cents per pound. These prices are shaded ¼ cent per pound in large quantities.

Glass.—Recently there has been a lack of uniformity in prices at which Glass is sold in the local market, the Jobbers' Association quotations not being rigidly adhered to. Some jobbers claim that Glass is being sold for less than it costs them, as prices have ranged from 90 and 5 to 90 and 20 per cent. discount. These quotations have varied according to the size of stock the jobber had on hand and his anxiety to sell. On August 18 the Executive Committee of the Jobbers' Association decided to issue a circular letter to jobbers, showing the undesirability of selling present stocks at less than it would cost to replace them, and urging them to maintain the association's schedule of prices. The association did not feel justified in advancing prices, not knowing what action the manufacturers would take in this matter. When the Jobbers' Association are ready to place an order for Glass it is believed that they will be compelled to pay an advance on 88 per cent. discount off the manufacturers' list, which was the price paid for the last allotment. Demand continues light. The Jobbers' Association's local quotations are as follows: In small lots, 90 and 5 per cent. discount for the first three brackets and 90 and 15 per cent. discount for all sizes above, either single or double strength.

Oils.—*Linseed Oil.*—The tendency was toward higher prices during the last part of last week, owing to an advancing flax seed market. This was caused by a falling off of flax seed receipts and backwardness in the Southwestern crop. A reaction in the seed market on Monday carried seed prices back to about their former level, and has, for the present, prevented an advance in the price of Oil. Quotations remain unchanged, as follows: City Raw, in lots of five barrels or more, 37 cents; in lots of less than five barrels, 38 cents per gallon. Out of town brands of Raw are quoted, according to quantity, at 35 to 37 cents per gallon.

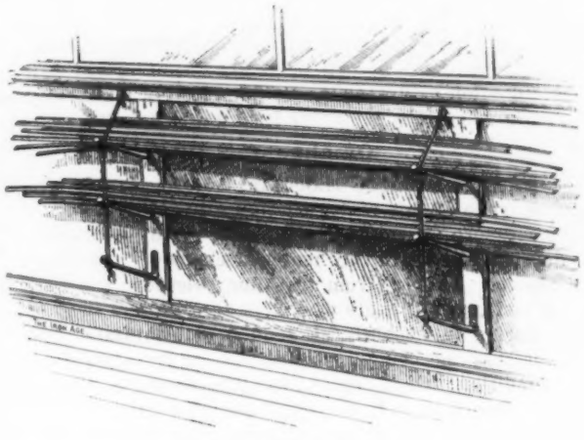
Spirits Turpentine.—Bullish advices from Savannah the last of last week and small stocks in the local market, caused an advance in Turpentine of 3½ cents per gallon. Owing to lack of demand at the advance the market has receded, and quotations, according to quantity, are as follows: Oil barrels, 54½ to 55 cents; machine made barrels, 55 to 55½ cents per gallon.

COLUMBIAN HARDWARE COMPANY.

THE COLUMBIAN HARDWARE COMPANY, Cleveland, Ohio, have just issued a pamphlet entitled "Hand Book of Joist Hangers for Architects," relating to the Cleveland Steel Joist, Wall and Timber Hangers, manufactured by the company. The pamphlet contains a letter from the Osborn Engineering Company of Cleveland, which is calculated to establish in the minds of architects and builders the fact that the tables are reliable. Special attention is directed to the table of equivalents and also joist and timber tables, which have been carefully prepared. As an example of the information contained in the pamphlet, it is shown that after determining the load it is desired for each floor to carry an architect, knowing the load per square foot, the span, the size of joist, can refer to the pamphlet and find the number of Hanger and ascertain the stock which would be used and the safe strength for each Hanger. On blue prints are illustrated Hangers regularly made, and also samples of a few special Hangers. The desire of the company has been to have the tables so accurately compiled by a disinterested party as to become standard in the offices of architects. The pamphlet has been copyrighted, which gives the company exclusive right to the tables it contains.

KEEPING WEATHER STRIPS.

WEATHER STRIPS are kept on harness hooks fastened to the front of a counter in the back part of the store of the Danbury Hardware Company, Danbury, Conn. A rope is fastened on the ends of the hooks, and to a screweye on the top of the counter, as



Keeping Weather Strips.

shown in the accompanying illustration, thus preventing the strips from falling off of the hooks. This is spoken of as being a convenient method for accommodating these awkward articles.

TRADE ITEMS.

F. E. MUZZY, second vice-president and sales manager of the J. Stevens Arm & Tool Company, Chicopee Falls, Mass., sailed Saturday, August 15, on the "Etruria," for a two months' vacation trip abroad. He will visit all of Continental Europe, spending most of the time in Switzerland.

THE local committee who are looking after the entertainment of the National Association of Agricultural Implement and Vehicle Manufacturers, whose annual meeting will be held in Cleveland, Ohio, October 20, 21 and 22, are moving actively in the direction of an elaborate reception of the delegates. F. E. Myers of Ashland, Ohio, chairman of the Executive Committee, was in Cleveland last week conferring with the committee regarding the plans for the convention. The members of the local committee will also participate in a meeting of the Executive Committee, which has been called for September 1 at Chicago.

GILBERT & BENNETT MFG. COMPANY, manufacturers of Wire Cloth, Netting and Wire Goods of varied character, with factories at Georgetown, Conn., and Wireton, Ill., have determined to abandon their old quarters and warehouse at 44 Cliff street, New York, and will remove about August 20 to a suite of offices in the Broadway Chambers, 277 Broadway. Hereafter orders will be received at the above address for shipment direct from the factory, and they will not carry stock in New York as in the past. The business will continue as heretofore under the charge of George H. Brown, the New York manager.

THE business of Peter Wright & Sons, Anvil and Vise makers, at Dudley and Oldbury, England, which for the past 20 years has been carried on by Charles Wallis and his sons, as announced in these columns July 16, will be conducted precisely as heretofore at Dudley by the new proprietors, Isaac Nash & Sons, who have had long experience in the same trade, their Anvils having obtained a high reputation in England and on the Continent. In other words, the Wright Anvils will be made and sold as a distinct business, as they have been in the past, and will not lose their identity by absorption as a result of the new ownership. This line is handled in the United States by Wiebusch & Hilger, 9-15 Murray street, New York.

Michigan Retail Hardware Dealers' Association.

CONCLUDING REPORT.

THE Wednesday afternoon session of the annual convention of the Michigan Retail Hardware Dealers' Association was well attended, between 80 and 90 members being present.

The annual address of the president, which was printed in the last issue of *The Iron Age*, brought to the attention of the convention several valuable suggestions which were recognized by the appointment of a committee to draw suitable resolutions and present them to the convention for enactment. The committee appointed by President Ireland was: J. T. Patterson, Detroit; W. P. Culver, Portland, and Frank L. Bean, Grand Rapids.

Treasurer's Report.

The report of the treasurer showed a balance on hand at the beginning of the fiscal year of $391.06, receipts during the fiscal year to date, $720, making a total of $1111.06. Disbursements during the year amounted to $799.68, leaving a balance on hand at the present time of $311.38. Upon motion the following committee was appointed to audit the accounts of the treasurer: S. Hunt, Detroit; Fred. J. Cook, Fowlerville, and A. Harshaw, Delray.

The reading of the annual report of the secretary, which was given in our last issue, was followed by a vote of thanks and appreciation of his valuable services to the association during his term of office.

Committees Appointed.

President Ireland announced to the convention that owing to the absence of certain appointees he had made a change in the make-up of the Committees on Credentials and Resolutions, and had reinforced the Committee on Nominations by adding two other members. The committees, as modified, are as follows:

CREDENTIALS: F. A. Turner, Caro; C. F. Lewis, Pentwater; J. J. Vandermeer, Grand Rapids.

NOMINATIONS: Henry C. Weber, Detroit; A. G. Schoenenberg, Saginaw; W. A. Hossack, Mendon; Charles Harris, Detroit; H. C. Minnie, Eaton Rapids.

RESOLUTIONS: J. G. Patterson, Detroit; J. H. Temmink, Greenville; F. Marshall, Ovid.

Competition and Margins.

The discussion which followed the reading of the paper upon "Competition and Margins," by Fred. J. Cook of Fowlerville, as published in our last issue, was participated in by Messrs. Culver of Portland and Wattels of Battle Creek.

W. P. Bogardus' Address.

In introducing W. P. Bogardus, president of the National Retail Hardware Dealers' Association, President Ireland paid tribute to his business integrity and to his special qualifications for the office of president of the National Association. Mr. Bogardus, who addressed the convention on the Parcels Post bill, said:

I am glad to be with you to-day, because it is like home to be in a gathering of Hardwaremen, and because Detroit has the reputation of being one of the most delightful convention cities in the country.

I bring to you the greeting of the National Retail Hardware Dealers' Association with the hope that your past history may be a stimulus to further effort, and that your ambition for membership may be limited only by your State lines. There has been an effort, for some time past, to have enacted into law a measure, entitled "A Bill for the Reclassification of Postal Matter," &c. Section 3 of the bill reads as follows: "On second-class mail matter, sealed or unsealed, not requiring special rapid transit, in parcels not over 1 pound in weight, 1 cent; over 1 pound, not over 5 pounds, 2 cents; over 5 pounds, not over 11 pounds, 5 cents; over 11 pounds, not over 25 pounds, 10 cents; over 25 pounds, not over 50 pounds, 15 cents; over 50 pounds, not over 75 pounds, 20 cents; over 75 pounds, not over 100 pounds—a half barrel—25 cents; and in larger parcels, for each additional 20 pounds, or fraction thereof, 5 cents (a keg of Nails from New York to San Francisco by mail for 25 cents." As we understand it, laws are made for the general good, and the several departments of the Government are carried on for the benefit of the general public. Laws which it can be shown are for the general good may—yes, should be—adopted; for the people own the Government and it is to be administered for their benefit. The question then comes up of what good is the proposed measure, How will it benefit the majority of the people, and will it be of enough advantage to overcome the extra expense that the adoption of the measure will entail on the people?

I hope that I do not enter upon the discussion of this question from the standpoint of selfish interest. I would like to divest myself of all motives of that kind and look upon the question at issue from a disinterested position. We must accept as a fundamental fact that

LAWS SHOULD BE OF A GENERAL NATURE.

They should be for the benefit of all. They should not show any favor, nor should they be made for any class. Laws made to favor a class are unjust, because they are not general, and do not give all citizens the same protection or opportunities.

We may properly ask, With whom did this measure originate? Who are pushing it forward, and what do they expect to gain by its passage? In the last Congress a member in advocating this measure, spoke of it as an "honest reform," and of the men who opposed it as "skulking traducers." Under the guise of reform a great many bills are brought before Congress. A large number of the so-called reforms do not reform, but are apt to entail a needless expense on the Goverment.

Since the world began men have bartered and trade has been the mainspring of action to move the world along. In the modern times methods of business are changing, and it has seemed to some that the right way to do business was to have an office and stock in some large city, and secure trade by soliciting through catalogues that contained a list of the goods kept in stock and by quoting very low prices on standard and well-known goods, seek to convey the idea that all goods purchased through them were cheaper than they could buy the old way, by going to the retail stores and selecting what was wanted. In the furtherance of this new method they advise the people who have their catalogues "to use the book as a check on your retail dealer to see that he does not rob you."

Does honesty come through misrepresentation? Is fair dealing built up through insinuations? To make their position stronger, and to hold out greater inducements these new methods men are seeking to induce the Government to help them distribute their wares through the passage of a Post Parcels law.

HAVE THE PEOPLE ASKED FOR SUCH A LAW?

Has there been any active canvass for the passage of such a measure? I have not heard that a large number of petitions have been presented to Congress, praying for the passage of such a law, but I have heard that a strong lobby backed by interested men will be in Washington next winter to do all they can to have the bill enacted into a law. Should it become a law, who will profit by it? Will it be the general public, or will it be the interested men who have sent the lobby to Washington? How is it going to help the general public? "Oh," says the advocate of the measure, "it will enable the man who wants anything to take his catalogue and sit down in the quiet of his home and select the articles he may want, and send his money to the catalogue house, and Uncle Sam will call and get the goods and deliver them to the customer. Will that make it any better for the customer? Will he get his goods any cheaper in the long

run? Will it be more satisfactory to buy goods "unsight and unseen," as we used to trade jack knives, or go to the store and make his own selection with the word and reputation of the dealer behind it? Will the proposed measure tend to build up the catalogue house and department stores, and, if so, at whose expense? If at the retailer's how will he live? If the retailer is driven out of business what will be done with all the storerooms in the towns and villages, and who will pay the taxes now derived from the great army of retailers over the country? But our reformer says that the idea that the retailers would be driven out of business by such a law is absurd.

EXPERIENCE IS A SCHOOL

in which we learn our lessons very thoroughly. The package post has been in operation in England many years. Towns and villages that once had numbers of retail stores now have none, or at best one small store that holds on to a very precarious living. What has become of the small retail stores in Philadelphia? What is the meaning of the empty rooms in Chicago that were once occupied by retail stores? Is the city becoming smaller? Take the retail stores out of the towns and villages and what have you left? Who are the people that are being continually called upon for contributions for all sorts of objects? If their means of living are cut off they will have to turn to some other vocation for a living. Then they will become competitors to the farmer, to the mechanic, to the laborer. When the retailers are gone who will pay the taxes in the towns and villages?

IS IT A WISE STATESMANSHIP

that would build up the city at the expense of the town and village? But, says our reformer, that is a picture that will never come true. Is it not the avowed intention of the catalogue houses to get the retail trade of the country? Is it not conceded by them that all efforts to accomplish this purpose are useless unless they have favorable prices and better transportation facilities? At the prices that they are quoting some goods is it not evident that they have already gotten favorable prices? Are not the hands of the catalogue house and department store plainly visible behind our reformer, who is seeking to get the Post Parcels bill enacted into a law? Let us not deceive ourselves, gentlemen. Already the sound of the movement of the lobby organizing to march on to Washington is heard. The funds to influence legislation are prepared. The argument that appeals with greatest force to our reformer is in the pockets of the lobbyist, who knows where to put it so that it will do the most good. These people in their selfishness are seeking to foist upon the public

A LAW THAT WILL BE BURDENSOME

to all except the few who hope to enlarge their business at the expense of the public, under the guise of a great and overwhelming love for the dear people. And they will appeal to Congress to help them at the expense of the thousands now engaged in the retail business all over this land. Business men have for several years tried to get one cent postage on letters. The Post Office Department has always objected on the ground that there is now a deficit of some millions in that department, and that the cutting of the letter rate to one cent would increase that deficit, for, they argue, there is no probability that the additional sale of stamps would make up the loss occasioned by the cut. This argument has always blocked any efforts to reduce the postage on letters to one cent. Now, if a letter of 2 ounces cannot be carried for less than 2 cents, except at a loss, how is it possible to carry one pound for one cent, or 100 pounds for 25 cents? Think of carrying a three-prong fork across the continent by mail for 2 cents! We can arrive at but one conclusion, and that is that the catalogue house and department store are more interested in the passage of this bill than any one else, and that they expect to receive the benefits that may arise from its passage. It is class legislation, and therefore unjust.

Vocal Music a Feature.

Several telegrams of regret from members who were unable to be present were received and read by the secretary.

The delegates were full of enthusiasm and especially demonstrative in appreciation of the singing of the Grand Rapids Quartette. Encores were frequent. The imitation of the Scottish bag pipe, the singing of "My Old Kentucky Home," and a composition especially adapted to the Hardware trade were applauded to the echo. The members of the quartette are: Frank L. Bean, Wm. T. Harris, Richard J. Brummeler and Carl Butkau.

THURSDAY MORNING SESSION.

Upon the reassembling of the members on Thursday morning, August 13, President Ireland announced that 57 new members had been secured, largely through the assiduous efforts of Secretary Scott. The announcement was received with applause.

Before the business of the meeting was resumed the Grand Rapids Glee Club rendered additional numbers, the solo entitled "My Creole Sue," by W. F. Harris, being especially enjoyed. The singing struck the keynote for the session, and its influence of harmony was marked throughout the morning.

The People from Whom We Buy.

Wm. W. Wixson of Minden City, upon being introduced by the president, read a paper entitled "The People From Whom We Buy." Before beginning his paper Mr. Wixson suggested that a committee of three be appointed by the president to draft resolutions upon the Parcels Post bill on the lines referred to in the address of Mr. Bogardus, president of the national association. Mr. Wixson also suggested that in drafting the resolutions a synopsis of the bill be included, and that blank petitions be circulated among business men identified with the Hardware interests, in this way securing additional support to defeat the proposed measure. Mr. Wixson's suggestions met with applause and subsequently were acted upon. His paper on the subject of "The People From Whom We Buy" was as follows:

First, who are they? the traveling salesmen, the jobbers and the manufacturers. I have been requested by your secretary to treat this subject, and in my paper to you, brother retailer, I shall try to look at you from the three standpoints named.

THE TRAVELING SALESMAN.

Having had 15 years' experience in the first two, I take the liberty of naming the traveling salesmen first, as most retailers buy the bulk of their goods through them. The traveling salesmen are expected and most always do have a smile for you when they call, and a store of good things up their sleeve, both in a business way as well as social. They try to make your lot lighter and brighter, although sometimes they find it rather hard to do so, especially when you meet them with that "Your house makes so many mistakes"—"they would not allow my claim"—"your prices are too high"—"it takes so long to get goods from you," or some other cold remark, even before you have told the traveler what mistake has been made, what claim you refer to, what prices are too high, and, last of all, the length of time your goods were on the way. You forget that the traveler is not the railroad company and cannot hurry it. The traveler has troubles of his own, and by adding more you do not benefit either him or yourself. But, on the other hand, what a pleasure it is for a traveler to go into one of his customers' stores and be met by "Hello, Billy; glad to see you, old man. What is new?" When greeted in this manner, you can bet if there is anything new or any special price or deals he has up his sleeve, that customer will get it. Why not all of you help the salesman and help yourself as well. Put yourself in his place just for a moment and look around, and by so doing you will no doubt see things in a new light, if you are one of the kind I have just mentioned.

One of the many things traveling salesmen in the Hardware line have to contend with is the selling of only one Hardware dealer in a town. This is all right, provided you give the salesman the bulk of your business; but when you split your trade up between from five to ten men, is it right to restrict or expect the salesman to sell only you? If you had a customer who was buying goods

of from five to ten other retail Hardware firms and he told you you must not sell Mr. B., although Mr. B. might make you a better customer, how would you take it? The traveler stands between two fires; the jobber expects him to sell goods, and you split your trade so it is only a little for each. If this does not apply to your way of doing, pass it by; but if it does, please think it over.

When you turn down one salesman because he or his firm sell the druggist, news man or dry goods man, it is no more than fair to use all the salesmen who sell to you the same; but I have known of a number of cases where members of our association have not done so. I have found in ten years as a retailer that by using the traveler as a friend, the most favorable results are obtained. When he comes into our store my first instructions have always been: "Now, boys, is there anything we want from Mr. ———? Look it up as soon as you can; give him an order if you have one for him." Then if he has any extra time to spend with us we give him as much attention as possible; but if he has other work to do, it gives him a chance to do it and get out of town on time after finishing his business, and that is what his firm pays him for and expects him to do. The successful traveler is in no hurry until he has your order; then he is in a hurry, as it is his duty not to idle away time or hinder you.

The retailer who is discourteous to the traveler stands in his own light, but may never see his error until he himself has gone on the road; but the retailer who has always a pleasant word and prompt attention for the traveler makes many an extra dollar by so doing.

The traveler cannot make a success without the support of his customer, neither can the retailer without the aid of the traveler; so it is to our interest to help each other. In my years of experience on the road I have yet to find a case where the traveler has refused his aid to a fellow man.

THE JOBBER.

He picks out a man whom he thinks will make a successful salesman, not alone in the number of dollars' worth of goods he will sell, but one who will represent him with honor to himself and the house, who will take care of his interest as well as take care to do what is right and fair with all. The jobber sometimes makes a mistake in the man, but who is perfect in his judgment? He pays the traveler a good salary and expects him to earn it, and at the same time make a profit for him; but no legitimate jobber expects or asks more than a fair margin on his goods. Sometimes the price one jobber has is higher than his competitor, or lower. Why? There are a number of reasons. If lower, in most cases they have an over stock, or are using that article as a leader to get customers interested, the same as you do when you sell 10-quart Pails for 10 cents, or 6-quart Pans for 5 cents. Do not think because you can buy a few items from some jobber at a cut price that the firm you are giving your business to is getting to be a back number. You will find the successful jobbers of to-day must be up to date.

When your order is taken by the salesman, he is just as anxious to get it on the way as you are. The jobber wants prompt attention given to every order or letter, and if there is sometimes a seeming neglect, do not be too speedy to lay to the jobber, but write him at once. As soon as any seeming neglect to you is called to his attention, he in every case will look it up and see where the difficulty has been, if any, on his part.

Please remember one thing: the jobber has not made a profit on any goods sold you until they are paid for. Please also remember you have no better friends in business than the jobbers. Who is it that when you have taken the 30 or 60 days' time which is allowed you on Hardware, when you find your collections are not coming, that you can go to and ask for more time? The jobber. Jobbers charge interest on past due accounts. Is that not just? If your account, say, for $600, is past due for 30 or 60 days, and you only pay one lot of bills while the same amount is coming due, so that you are having the use of $600 worth of the jobber's money in your business all the time and making from 10 to 20 per cent., is it more than right that you should pay the jobber interest for the use of the money?

When you receive a box of goods and find some of them broken, is it right to jump on the salesman or jobber? I say no. Jobbers employ expert men to do the packing and pay them well for their work, and in most cases the broken goods are caused through careless handling by the transportation company's employees or your drayman. It is your duty to report at once the condition goods were received in, and state parts of goods broken, thereby giving the jobber a chance to order new parts for you, instead of shipping goods back, as is often done, without giving the firm any notice.

Sometimes you ask your freight agent to enter a claim, and he is discourteous or refuses to do his duty. In such cases if you will refer the matter to your jobber, he will see that your claim is given proper attention by the transportation company; but do not forget that when the jobber receives a clear receipt from the carrier his responsibility ceases, and the transportation company assume all risk until goods are delivered to you.

If you have any claim against the transportation company for damage of any kind, the jobber will be very glad to take it up for you and credit your account when paid. Is it right for you to go after the jobber or salesmen when the railroad company have carried part of your goods wrong? No, give him a chance to help you trace the goods, and you will find him with you in every case ready to help locate your goods and get them to you as speedily as possible.

When you receive a back order or cancel sheet from the jobber do not be too speedy to criticize him for being out of goods. Is your stock always complete? Remember the goods which the jobber has to back order or cancel, made him no profit but has made him more work than if he had been able to fill your order complete. You may sometimes reorder at once from another jobber in the same town, and get goods promptly, but that does not signify that you could not have done the same thing from the jobber who back ordered or canceled your order, as goods are coming in and going out of a wholesale house every hour when they are doing business. Sometimes he has only a few seasonable goods on hand, just enough to fill his own orders, and in such cases he will not sell them to his competitors and let his own customers go without, but you will find your jobber is just as anxious to fill your order as you are to have him. The jobber appreciates your many favors, and would be pleased to meet you at his place of business, or yours, often if he could do so, and it would pay you to see the firms you are buying from once in a while. You would then no doubt feel different when you get a letter from some department, which does not read to your liking. The letter may be short or not answer your inquiry, but you may be sure that it is not the wish of the jobber to ignore your wishes, or be discourteous to you, but it is usually through the party who wrote you not understanding your wants, as things look different in a letter than when you can talk it over.

THE MANUFACTURER.

You know the manufacturer does his business largely through the jobber, but a number of us buy direct from the manufacturer on special lines in a great many cases not on account of price, but because we wish some special line of goods not handled by the jobber, or because we favor some salesman who sells on commission direct. Our dealings with the manufacturer, in most cases, are about the same as with the jobber, so I will only call your attention to a few of the misunderstandings with them.

We wish some repairs for goods, but do not give complete dates, numbers or letters, and an answer comes back for further particulars. Do we always comply and blame ourselves, or the manufacturer for not being a mind reader. When we have some defective goods or other goods which you wish to return, we should in every case first write the manufacturer or the jobber, and state our wishes, and they can then instruct us where to send the goods to save us or them freight, and in every case we should send the manufacturer or jobber freight receipt and bill for goods sent them. They will then know what is coming back and from whom.

If you would keep a copy of every letter or order sent the manufacturer or jobber and answer all letters promptly, you would find it would do away with much trouble for all. When you give the manufacturer or jobber a future order, please remember that order stands, unless you cancel it, and neglect on your part to cancel an order should not be blamed to any one but yourself. All such future orders are taken with the price guaranteed to date of shipment, the firm holding the order to have the privilege of meeting a lower price you may have been quoted, or canceling at their option, according to contract. Under this guarantee it is not right to cancel orders, but your duty is to notify the firm with whom your order is placed that you have a lower price, and name it. Then they can either meet it or cancel, giving you the opportunity to buy elsewhere.

The manufacturer, when a bill comes due, expects his cash at once, or draws on us at sight. Do we honor their drafts, or feel they are in too big a hurry for their money? We sometimes forget the manufacturer only knows most of us by the orders we send him, or the cash. The manufacturer buys a new patent at a high figure, or pays a royalty on some article to manufacture, and as they have the exclusive sale for a short time, they charge a high price for the goods. Would we not do the same if we could? Often the manufacturer makes a lot of goods only to find after a quantity have been sold that they have run through the factory imperfect. Should we be too severe in our opinions of this firm's goods? Would it not be better to give them a chance to make good our loss? Just remember our loss is small compared with theirs.

Some years ago in talking with a workman who had been let out by the foreman in a large factory, this man said to me: "Well, I got even with the old firm." I asked him in what way, and he told me he had run his machine open the last day. Now this no doubt caused a lot of trouble for the manufacturer who was in no way to blame.

The manufacturer or jobber sometimes comes into your town and sell orders direct to the factories or consumers. But would they do it if you were on the look out for the business, or if you had gone after it yourself? You no doubt would have been able to have had their help in landing the order, and had the goods billed through you or a commission on the sale. In a great many cases I know where nice commissions have been given to the up to date retailer.

Now, Brother Retailers, I have tried to look at you through the three standpoints named, and if no part of this paper applies to you, I am glad of it; but if any part does, just put yourself in the other man's place for a few moments and see what you would have done.

Having been one of the first members of this association and having attended all but one of the annual meetings, I have found that you all would rather have the facts than flattery at an annual meeting, so have taken the liberty at the request of your secretary of giving you cold facts.

Messrs. Wright of Holly, Bogardus of Mt. Vernon, Ohio, Bean of Grand Rapids, and Fred. J. Cook of Fowlerville, made pertinent remarks upon Mr. Wixson's paper, supporting and reinforcing his recommendations. Mr. Bogardus and Mr. Bean referred to the legal aspect of the question of returning damaged goods, from which the convention profited.

Looking Both Ways.

After it had been decided that the members of the association be photographed as a body after the the morning session, President Ireland introduced Henry C. Weber of Detroit, who read a paper entitled "Looking Both Ways," which was printed in our last issue.

Organization.

In introducing C. M. Alden, the first president of the Grand Rapids Association, President Ireland paid a high tribute to the success which local organization had attained at Grand Rapids. Before addressing the association upon this subject Mr. Alden took occasion to compliment Detroit for its many commercial advantages and social features, from both of which the Hardwaremen received untold benefit. Mr. Alden also entered a plea for the extension of local organization and the election of delegates from such associations to an annual State convention in lieu of the present State organization. His address was very interesting and punctuated by humorous stories peculiarly adapted to the occasion. Mr. Alden's paper appeared in our last issnue.

Suggestions and pertinent remarks upon organization were made by Wm. More of Detroit, John Popp of Saginaw, E. J. Foster of Grass Lake, G. W. Bruske of Saginaw, C. M. Alden of Grand Rapids, J. H. Sperry of Port Huron and Fred. A. Rechlin of Bay City.

The Parcels Post Bill Again.

A. Harshaw of Delray moved that a committee of three be appointed by the chair to report resolutions on the Parcels Post bill, in accordance with the suggestions made by Mr. Wixson of Minden City, which was carried, the president appointing A. Harshaw, Delray, chairman; John Popp, Saginaw, and C. M. Alden of Grand Rapids.

Mr. Wixson suggested that the president and secretary be instructed in sending out the petitions upon the Parcels Post bill to include grocers and dry goods men among the merchants to be invited to support the movement against the proposed Parcels Post bill.

THURSDAY AFTERNOON SESSION.

Immediately upon reconvening on Thursday afternoon the report of the Committee on Constitution and By-Laws was taken up, which was subsequently approved and the committee discharged. While some radical

changes have been made in phraseology, necessitating the rewriting of the entire constitution, the new measures do not make innovations of great importance.

Article I, containing Sections 1 and 2, is unchanged. Section 1 of Article II has been modified by the elimination of superfluous words, and the same remark applies to Article III upon "Membership Responsibility." Section 1 of Article IV has been unchanged, but Sections 2, 3 and 4 have been modified more or less, Section 2 radically. Section 5 is practically the same and Section 6 is unchanged. Sections 7, 8 and 10 have been modified by the elimination of certain portions and additions in others. Section 9 is unchanged. Sections 1, 2 and 3 of Article V, relating to annual and special meetings, have been modified. Article VI, in regard to vacancies, stands as in the original. Section 2, Article VII, has been eliminated, but Section 1 is unchanged. Article VIII, in regard to initiation fees and dues, has been modified and provision made for the payment of dues to the national association. Article IX, in regard to revisions or amendments, has been divided into two sections, instead of one, as originally was the case, the second section providing that speeches, papers and addresses be limited to

15 minutes and that no subjects foreign to the Hardware business be permitted.

New Constitution.

Following is the constitution:

ARTICLE I.

NAME AND OBJECT.

Section 1. The name of this association shall be the Michigan Retail Hardware Dealers' Association.

Sec. 2. The object of the association shall be to promote the welfare of the retail Hardware trade of Michigan.

ARTICLE II.

MEMBERSHIP.

Section 1. Any person, firm or corporation engaged in the retail Hardware business in the State of Michigan, whose name has been approved by the Executive Committee, may become a member by subscribing to the constitution and by-laws and paying the membership fee therefor.

ARTICLE III.

MEMBERSHIP RESPONSIBILITY.

By subscribing to the constitution and by-laws, the member accepts the conditions imposed, and agrees to carry out all requests of the Executive Committee.

ARTICLE IV.

Section 1. The officers of the association shall consist of a president, vice-president, secretary and treasurer, and ten members selected from different parts of the State who, with the president, vice-president, secretary and treasurer, shall constitute the Executive Committee.

Sec. 2. Five members of the Executive Committee shall be elected each year, to hold office for two years, and until their successors shall be elected and qualified.

Sec. 3. The president shall appoint a sergeant-at-arms at each meeting.

Sec. 4. The president shall appoint a Nominating Committee of five on the first day of each annual meeting. The Nominating Committee shall report the second day, with nominations for officers and five members of Executive Committee, as well as others to fill vacancies, if any.

DUTIES OF OFFICERS.

Sec. 5. The president shall preside at all meetings, and be and act as the chief executive officer; shall act as an executive member of all committees, and shall sign, with the secretary, all orders on the treasurer and calls for meetings, all certificates of membership, and shall appoint all committees not otherwise provided for hereinafter, and shall transact all business commonly devolving upon a president of like associations.

Sec. 6. The vice-president shall perform the duties of president in case of the president's absence or incapacity.

Sec. 7. The secretary shall direct the preparation and have the custody of the records, membership roll and minutes of meetings; shall conduct all official correspondence, and have the custody of all property not especially entrusted to other officers; shall make and keep a correct account of members joining, all fees and dues received, and shall perform such other duties as shall be assigned to him from time to time; shall sign all certificates of membership, shall pay to the treasurer all moneys received, or vouchers representing such money, taking the treasurer's receipt therefor, and shall sign all orders on the treasurer for all moneys paid out, and shall report the standing of his office when called for by the Executive Committee. All books, records, &c., belonging to the association and kept in the custody of the secretary shall at all times be open to inspection of all officers of the association. The secretary shall be the officer to whom the organizer shall make all reports and deliver all membership fees. The secretary shall give bonds, at the expense of the association, for the faithful performance of his duties. The secretary shall be the *ex-officio* member of all committees, and shall be the secretary of the Executive Committee, for which he will receive a salary of $150 a year, to be changed as his duties increase.

Sec. 8. The treasurer shall perform all duties commonly pertaining to such office, and at the meeting following the acceptance of office shall give bonds, at the expense of the association, for faithful performance of his duties. He shall receive and care for all moneys paid to him by the association or its secretary, and invest or deposit the same as directed by the Executive Committee, and shall pay out only on orders in regular form; shall keep an accurate account of all moneys received and disbursed, and shall carefully keep all vouchers for the same. He shall make a full and complete report of the condition and affairs of his office at each annual meeting, or at any time when requested by the Executive Committee. At the expiration of his term of office he shall transfer all property of the association to his successor, or to such person or persons as the Executive Committee shall direct.

Sec. 9. It shall be the duty of the sergeant-at-arms to see that none but members shall be admitted, except by order of the presiding officer.

Sec. 10. The Executive Committee shall have general charge of affairs of the association when no meeting of members is in session; shall be entrusted with the execution of all resolutions of the meetings of the association; shall pass upon the eligibility of all applicants for membership; shall have charge of all complaints; shall provide a place of meeting of the association; shall arrange programme for annual convention, and shall have charge of all business of the association not otherwise provided for. The president shall appoint an Auditing Committee from the members of the Executive Committee to examine the books of the secretary and the treasurer, and report at the executive session of each annual meeting.

ARTICLE V.

ANNUAL MEETING.

Section 1. The meeting of the association shall be held the second Wednesday in August of each year, and shall continue in session until the business of the meeting shall be disposed of. Twenty-five members shall constitute a quorum.

SPECIAL MEETINGS.

Section 1. A special meeting may be called at any time deemed necessary by the Executive Committee.

Sec. 2. The Executive Committee shall meet at the call of the president, not exceeding four times a year, and actual expenses shall be paid by the association.

ARTICLE VI.

VACANCIES.

In case of the vacancy of any office of the association, the same shall be filled by the Executive Committee until the next annual meeting.

ARTICLE VII.

EXPULSION.

Any person, firm or corporation can be expelled from membership for cause.

ARTICLE VIII.

FEES.

Section 1. Fees for membership shall be $4, which shall include dues to January 1 of the following year, of which $3 is for membership in the Michigan Association and $1 for membership in the National association.

Sec. 2. The dues shall be $4 per annum, payable in January for the ensuing year, and the secretary shall draw upon each member on February 1 for any dues then in arrears, and refusal to pay such draft will forfeit membership. No membership shall entitle the holder to more than one representative and one alternate.

ARTICLE IX.

REVISIONS OR AMENDMENTS.

Section 1. Amendments to constitution and by-laws may be made at any regular meeting by a two-thirds vote of members present.

Sec. 2. Speeches, papers and addresses by members and others shall be limited to 15 minutes, and no politics or subjects outside of the Hardware business will be solicited or allowed.

Address of Louis C. Wurzer.

At this juncture Louis C. Wurzer, assistant prosecuting attorney of the city of Detroit, addressed the association upon commercial subjects, alluding to the accomplishments of business interests of the country in recent years and pointing out the tendency of organization in the business community. His address was punctuated by occasional illustrative digressions of a humorous nature. He also presented some official statistics in regard to the foreign trade of the United States in comparison with the export trade of Great Britain.

Report of Committee on Resolutions.

The Committee on Resolutions then made the following report, which was adopted by the convention:

Whereas, On February 28 of this year death took from us one of our charter members and one of the most earnest workers in our association, W. J. Boyce, Port Huron,

Resolved, That we, the Michigan Retail Hardware Dealers' Association, desire to bear testimony to the many virtues of our deceased brother, who has so often in the past met with us at our annual meetings; and that by his departure the association has suffered a distinct loss and a great many of our members a loyal, true-hearted friend; and that the above resolution be spread on the minutes of the association and a copy of same be forwarded to the family of our deceased brother.

Whereas, Although we, the delegates of this convention, have by a rising vote of thanks to W. P. Bogardus expressed our feeling toward him for his kindness in preparing the able address to which we listened at our Wednesday afternoon meeting,

Resolved, That we desire to still further impress upon our esteemed friend the fact that we appreciate the time and work which he has so cheerfully devoted to the work of this organization, and hope that we may have him with us as our honored guest at many future meetings of this association.

Resolved, That we, the Retail Hardware Dealers' Association, are as a body and individually indebted to the several jobbers and manufacturers of the city of Detroit for the pleasant entertainment they so willingly provided us at this our annual convention, and be it further

Resolved, That we hope that the pleasant relations brought out at these meetings will continue for mutual benefit.

Resolved, That we, the members of the Michigan Retail Hardware Dealers' Association, are as a body and in-

dividually indebted to the proprietors of the Hotel Cadillac for the many courtesies which they have extended to us, at this, as well as previous, meetings held in this hotel; and be it further

Resolved, That we extend to them our sincere thanks and wish them all the success to which their treatment of their guests entitles them.

The Grand Rapids Quartette then favored the association with three numbers, the last two being in response to encores.

Question Box.

The Committee on Question Box reported that it had received eight questions, as follows:

Question 1. How do the Congressmen of Michigan feel about the Parcels Post bill?

This was answered by Mr. Harshaw of Delray, who was of the opinion that while Congressmen might be inclined to give ear to the Hardware trade, that they were necessarily shrewd and guarded in their answers. Messrs. Weber and Scott also spoke briefly to the question. Mr. Wixson of Minden City made a motion that the secretary be instructed to send letters protesting against the passage of the Parcels Post bill.

Question 2. What is the best way for a Hardware dealer to advertise in cities of large size, especially when located in the central part, to reach the people in the suburbs and get the best results?

Mr. Bean of Grand Rapids spoke to the question, recommending that special attention be given to window displays, and giving illustrations of how he had endeavored to attract trade by the display of special goods during certain seasons—Saws and Axes at one time and Fishing Tackle at another. He had found but little return from advertising in local papers, because such seldom reached the people to whom he catered. Other members spoke to the subject, especially referring to the exercise of courtesy to customers and the delivery of goods, with special instances cited; but in the main the question was not answered satisfactorily.

Question 3. How can we meet competition of architects?

It seemed to be the sense of the meeting that this matter could be handled by the executive committee in connection with the jobbers in a similar manner as had been done in the case of small contractors. The impression prevailed that the matter could be settled through the local associations.

Question 4. Can we not increase our membership by having our annual meetings at places more centrally located than Detroit?

As this matter was to be brought up subsequently it was passed temporarily.

Question 5. How many members here have circulated or signed petitions to be forwarded to Congressmen protesting against the Parcels Post bill?

In response to requests by the president seven members responded, and a few threw some light on the subject by explaining the attitude and responsibilities of Congressmen, learned through personal acquaintance and otherwise. A rousing speech upon the subject was given by President Bogardus of the National Association, and further action was determined upon. It was decided as desirable that a copy of the resolutions and of the bill be sent to all Hardwaremen that they might be well informed in regard to the measures of the proposed law.

Question 6. Why are the jobbing Hardware interests not more loyal and interested in our association?

This question brought out the fact that the jobbers, especially the members of the National Hardware Association, are loyal and are interested in the organizing of the retail dealers, and that they are lending valuable assistance to promote the orgainzation of local associations throughout the State. From the remarks it was evident that there is a spirit of harmony prevailing among jobbers and dealers, and that recent events have tended to draw them much closer together, jobbers having given valuable assistance in trying to correct many trade abuses.

Question 7. Is not a dealer required by law to post notices in places of business or printed on stationery in order to legally collect interest on accounts?

A reply was given that if the terms of the sales are placed upon the invoice or upon the monthly statements interest could be legally collected without the posting of notices, although some difference of opinion seemed to exist.

President's Recommendations.

The committee which had been appointed to consider and draft resolutions pertaining to the suggestions contained in the president's annual address reported at this juncture as follows:

That your committee cannot recommend the changing the time of meeting from August to February.

And that in the matter of getting new members, our new secretary be ordered to designate a member from each county to solicit membership, and that each person receive one-half yearly dues for expenses.

The third recommendation of having executive sessions each day of our meetings we thoroughly endorse.

Also the fourth, that the names of members be kept secret, as the president suggests, so that in this warfare for trade we do not enlighten the enemy.

The last recommendation should also be strong in your minds—namely, attend your local and State conventions.

The Parcels Post Bill.

Chairman Harshaw of the committee which had been appointed to draft resolutions pertaining to the Parcels Post bill, read his report, which was subsequently adopted and the committee discharged. The report is as follows:

We, the undersigned business men and citizens of Michigan, have learned that a bill is now pending before Congress, known as the "Parcels Post Bill," which provides that large parcels of merchandise may be sent through the mails at a mere nominal cost of from 1 cent a pound to 25 cents per hundred pounds, varying from one pound to 100 pounds or more. We are thoroughly convinced that this kind of legislation is being urged by the mail order and catalogue houses, and if allowed to become a law will have the effect of ruining the business interests of the retail merchants throughout the country, and also would increase the large deficiency of several millions of dollars that now exists in the Post Office Department. We therefore earnestly and firmly protest against the passage of said bill.

Report of Auditing Committee.

The Auditing Committee reported that they had examined the books and vouchers of the treasurer and found them correct. They recommended that his report be adopted and spread upon the records, which was done.

Miscellaneous Business.

The secretary read a communication from President Williams of the Illinois Hardware Association, expressing his regret that he was unable to accept the invitation to be present at the convention. Secretary Matthews of the Minnesota State Association sent a letter of congratulation and a number of pamphlets on mutual insurance, which he desired to be circulated among the members of the Michigan Association.

Hardware Day.

President Bogardus of the National Association informed the association that the administration of the Louisiana Purchase Exposition were desirous of having a day designated as "Hardware Day" at St. Louis some time in June, September or October. The exposition management was seconded by the Missouri Hardware Association. After some few remarks the matter was referred, upon motion, to the Executive Committee to express their views as to the desirability of co-operating with other State associations for the setting apart of a special day to be known as "Hardware Day" at the exposition.

To Print and Circulate Reports.

Upon motion it was decided to have the various papers, addresses and reports printed and mailed to members of the association, and upon amendment it was decided to mail letters pertaining to the Parcels Post bill at the same time.

Next Meeting at Grand Rapids.

C. M. Alden of Grand Rapids announced to the convention that he had been requested to invite the association to hold its next annual meeting—the second Wednesday in August—at Grand Rapids, and subsequently, upon motion of Fred. J. Cook of Fowlerville, sup-

ported by Henry C. Weber of Detroit, the invitation was accepted.

Election of Officers.

The Committee on Nominations reported having selected the following officers to serve during the ensuing year:

PRESIDENT, John Popp, Saginaw.
VICE-PRESIDENT, F. M. Brockett, Battle Creek.
SECRETARY, A. J. Scott, Marine City.
TREASURER, Henry C. Weber, Detroit.

EXECUTIVE COMMITTEE.

Term Expires 1904.	*Term Expires 1905.*
S. Hunt, Detroit.	W. P. Culver, Portland.
F. A. Turner, Caro.	K. S. Judson, Grand Rapids.
F. S. Carlton, Calumet.	J. H. Whitney, Merrill.
J. B. Sperry, Port Huron.	E. J. Morgan, Cadillac.
J. G. Patterson, Detroit.	T. Frank Ireland, Belding.

Upon motion the different candidates were elected unanimously.

Upon the announcement of the result of the ballot President T. Frank Ireland thanked the association for their hearty support of himself and the secretary during the past year, and said it was with both sadness and joy that he laid down the gavel—sadness because of the severing of the pleasant relationships that he made, and joy through escaping from the arduous duties of the association work. He bespoke for his successor the same kind of support by which he had been sustained during his term of office.

Mr. Popp, the newly elected president, upon being introduced, said:

This is somewhat of a surprise. It is an office that I had never expected to hold, but I wish to thank you all for the honor you have bestowed upon me in electing me as your president, and you may depend upon it that I shall at all times try to carry out all duties of the office to my best ability. I trust that I may enjoy the same success as my friend, Mr. Ireland, has, and I again thank you for the honor.

One of the pleasing features of the closing moments was the number of humorous and witty stories indulged in by various members and guests of the association, putting all in an especially good humor when the motion to adjourn prevailed.

Those Present.

The following is a partial list of those in attendance at the convention:

T. Frank Ireland, Belding.
A. J. Scott, Marine City.
Henry C. Weber, Detroit.
E. B. Standart, Holland.
J. B. Sperry, Port Huron.
Samuel W. Winchester, Jackson.
J. H. Temmick, Greenville.
D. C. Miller, Clifford.
J. A. Webster, Lansing.
F. H. Gibbs, Coleman.
C. M. Allen, Grand Rapids.
A. Harshaw, Delray.
E. S. Roe, Buchanan.
H. B. Gunniss, Algonac.
Jos. Raymo, Detroit.
Oliver Raymo, Detroit.
E. J. Hadden, Grand Rapids.
Richard Brummeler, Grand Rapids.
C. A. Bertkau, Grand Rapids.
Wm. T. Harris, Grand Rapids.
Frank L. Bean, Grand Rapids.
J. J. Vander Meer, Grand Rapids.
Fred. J. Cook, Fowlerville.
C. J. Zilk, Lenox.
J. M. Williams, North Adams.
C. F. Lewis, Pentwater.
W. A. Hossack, Mendon.
A. N. Patriarche, Marlette.
Chas. A. Sturmer, Port Huron.
S. L. Boyce, Port Huron.
M. A. Benson, Saranac.
A. G. Schoenenberg, Saginaw.
F. M. Bennett, Battle Creek.
F. A. Turner, Caro.
J. G. Patterson, Detroit.
Chas. Rounds, Yale.
Geo. W. Leedle, Marshall.
J. H. Hatt, Marshall.
J. H. Whitney, Merrill.
S. G. Crankshaw, Mayville.
D. H. Pierce, Ubly.
Hunt & Roehrig, Detroit.
V. C. Wattles, Battle Creek.
N. C. Mason, Blanchard.
Geo. P. Griffin, Albion.
Harris & Petri, Detroit.
John McGraw, McGraw & Cone, Jackson.
D. L. Whitenack, Tecumseh.
J. C. Cozadd, Wayne.
W. P. Packard, Perrinton.
A. C. Gradolph, Petersburg.
E. W. Gust, Morenci.
G. W. Gust, Morenci.
F. C. Schard, Layman.
C. H. Schlaack, Birmingham.
Emil Jochen, Saginaw.
E. Culver, Portland.
S. E. Dean, Orgo.
Geo. P. Ratz, Brighton.
G. T. Gready, So. Lyons.
J. C. Reynolds, Concord.
G. W. Bruske, Saginaw.
L. E. Salisbury, Fulton.
O. C. Sperry, Chesaning.
P. A. Wright, Holly.
H. C. Minnie, Eaton Rapids.
C. A. Day, *Trade*, Detroit.
M. F. Sieb, Monroe.
Fred. A. Rechlin, Bay City.
Edw. Atyeo, Belleville.
Wm. W. Wixson, Minden City.
Geo. B. M. Towner, Muskegon.
W. H. Waymer, Utica.
Seymour Worden, Harbor Beach.
Miehlig & Schmid, Ann Arbor.
E. E. Kohler, Byron.
E. J. Foster, Grass Lake.
John Popp, Saginaw.
Ed. H. McGowan, West Branch.
W. P. Bogardus, Mt. Vernon, Ohio.
Geo. N. Smith, Hillsdale.
G. T. Newkirk, *Trade*, Detroit.
Gartner Hardware Company, Wyandotte.
Burton Nye, New Haven.
J. W. Draper, Detroit.
Frank T. Bock, Battle Creek.
F. Marriett, Detroit.
J. O. Becraft, Estate of P. D. Beckwith, Dowagiac, Mich.
W. T. Leckie, Estate of P. D. Beckwith, Dowagiac, Mich.
W. T. Partridge, *The Iron Age*, Chicago.
A. J. Carson, E. C. Atkins & Co., Indianapolis.
W. H. Pipp, Columbian Enameling & Stamping Company, Terre Haute, Ind.
H. L. Pipp, Columbian Enameling & Stamping Company, Terre Haute, Ind.
C. S. Bigsby, Garry Iron & Steel Company, Cleveland, Ohio.
Jas. W. Sleight, the Columbian Enameling & Stamping Company, Terre Haute, Ind.
N. Christopherson, A. J. Lindemann & Hoverson Company, Milwaukee, Wis.
F. R. Lawrence, Detroit Stove Works, Lansing.
M. B. Williams, *The Iron Age*, Chicago.
E. T. Lane, Allerton-Clarke Company, Chicago.
G. W. Morley, Jr., Detroit Stove Works, Lansing.
H. H. Seeley, Superior Mfg. Company, Ann Arbor, Mich.
E. K. Springer, Devoe & Raynolds Company, Chicago.
F. L. Anderson, Elliott Mfg. Company, Warren, Ill., and the Voss Bros. Mfg. Company, Davenport, Iowa.
Day Gordon, Morley Bros., Saginaw.
B. L. Schmitt, White Lily Washer Company, Davenport, Iowa.
R. P. Searle, White Lily Washer Company, Toledo, Ohio.

CONVENTION NOTES.

The Estate of P. D. Beckwith, manufacturers of the Round Oak Stoves and Furnaces, Dowagiac, Mich., held a reception in Parlor G at the Cadillac, being well represented by J. O. Becraft and W. T. Leckie. This company have recently placed on the market a handsome Steel, Nickel Mounted Range, which has been christened the Round Oak Chief. The Indian chief will long be remembered by the numerous souvenirs which he distributed, consisting of Silver Spoons, Match Boxes, Miniature Stoves, to say nothing of samples of the Indian weed.

One of the neatest and most suggestive of the souvenirs distributed during the convention was the Silver Watch Fob presented by E. C. Atkins & Co. of Indianapolis, Ind., through the instrumentality of their Kalamazoo representative, A. J. Carson. The design is a Disk Saw pendent from a silver buckle attached to black silk, the reverse of the Disk being stamped with the company's monogram, and the obverse with the head of E. C. Atkins, and the announcement that the firm were established in 1857. The company occupied Parlor H at the Cadillac.

The Columbian Enameling & Stamping Company of Terre Haute, Ind., were represented by W. H. Pipp, H. L. Pipp and Jas. W. Sleight. This company again gave evidence of their enterprise by distributing samples of Enameled Ware in the shape of a small double Boiler, especially adapted to the needs of the nursery or the sick room for the heating of milk, medicine or similar articles. An interesting display of the general line manufactured by this company was exhibited in Parlor I.

Day Gordon and G. W. Morley, Jr., representing Morley Brothers of Saginaw, industriously circulated souvenir buttons bearing the well-known clasped hands, the trade-mark of the firm, with the dates 1863-1903 beneath the hands, indicating the grasp that the years have given them upon their friends in business.

The Detroit Stove Works, Detroit, were represented by F. R. Lawrence of Lansing and J. A. Weston.

The interests of the Superior Mfg. Company of Ann Arbor were well taken care of by H. H. Seeley of Ann Arbor, who exhibited the line of Gasoline Vapor Lamps and the lighting system of the company intelligently and effectively.

The Devoe & Raynolds Company of Chicago were represented by E. K. Springer, who not only talked Paint, but decorated the coat lapels of all callers with a miniature artist's Pallette decorated with tiny bits of color.

B. L. Schmitt, president of the White Lily Washer Company, Davenport, Iowa, and R. P. Searle of Toledo, together demonstrated the fine points of the White Lily Washer. The souvenir was the appropriate white lily, so well distributed during the past winter.

The Voss Brothers Mfg. Company of Davenport, Iowa, intrusted the exhibition of their Ocean Wave Washer to L. F. Anderson and N. Christopherson in Parlor D. The exhibitors laid special stress upon the mechanical features and the ease with which the Washer is operated.

The A. J. Lindemann & Hoverson Company of Milwaukee were represented by N. Christopherson of Man-

istee, who presented each caller with a souvenir Key Ring. This company, who have recently enlarged their factory and increased their working force, announce a large increase in recent sales of Gas, Gasoline and Air Tight Stoves. The interests of the J. L. White Furnace Company of Milwaukee were also well cared for by Mr. Christopherson.

The Elliott Mfg. Company of Warren, Ill., under the direction of F. L. Anderson, made an effective display of Anti-Rust Tinware in Parlor D.

F. E. MYERS & BRO.'S PICNIC.

THE third annual picnic tendered by F. E. Myers & Bro., Ashland, Ohio, to their employees, was held on the 8th inst. at Silver Lake. Between 2000 and 2500 persons participated in last year's gathering, but this number was greatly exceeded at this year's picnic, the many pleasant features of which were enjoyed by the employees and their friends and relatives to the number of 3000. Three trains of 12 to 15 cars each were required to carry this large pleasure party to the scene of the festivities. The whole affair was admirably managed, and the picnic was probably the most interesting of the series. This enterprising firm are to be congratulated on their success and the obviously very cordial relations which exist between them and their employees, which has doubtless contributed not a little to the firm's prosperity and growth.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS *for catalogues, price-lists, quotations, &c., have been received from the following houses:*

FROM EL PASO HARDWARE COMPANY, Kranzthor Bros., proprietors, who have purchased the wholesale and retail business formerly conducted by Tanner-Pennabaker Hardware Company, El Paso, Texas. The new company are intending to enlarge the business, especially in the wholesale department.

FROM PLANTERS' HARDWARE COMPANY, Wadesboro, N. C., who have been incorporated with a capital of $25,000, to carry on the wholesale business in Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, Paints and Oils, Sporting Goods, &c.

FROM WAKEFIELD MERCANTILE & MFG. COMPANY, Wakefield, N. C., who have lately added to their line a stock of Harness, Farm Implements and Machinery, Buggies, Wagons and Stoves.

FROM BAKER, OSGOOD & CO., who have lately purchased the Shelf and Heavy Hardware, Stove, Tinware, Paint and Sporting Goods business of E. E. Burnham & Co., Deerfield, Mich.

FROM KANE & OWENS HARDWARE COMPANY, Weston, W. Va., who have been incorporated with a capital stock of $20,000 to carry on the wholesale and retail business in Hardware, Tinware, Stoves, Building Material, Paints and Oils, Sporting and Athletic Goods, &c.

FROM W. N. CRENSHAW, Okmulgee, I. T., who has just embarked in the general Hardware business.

FROM ROSS & RANDALL, Freeport, N. Y., who have nearly completed their new Hardware store and will be ready to occupy it about October 1. They have confined themselves heretofore to Builders' Hardware only, but intend to add Boating Hardware, Agricultural Implements, Wheelwrights' and Blacksmiths' Supplies, and to some extent Household Hardware, besides increasing their line of Builders' Hardware and Tools. The firm would be pleased to receive catalogues and price-lists and other printed matter pertaining to these lines, and also will meet, by appointment only, representatives of houses dealing in above goods.

FROM LAKE PROVIDENCE HARDWARE COMPANY, Lake Providence, La., who are adding a furniture department to their business and desire printed matter relating to this line.

FROM BUNTING-STONE HARDWARE COMPANY, Kansas City, Mo., who have succeeded Gille Hardware & Iron Company in the wholesale and retail business in General Hardware, Stoves, Tinware, Paints, &c. The company occupy a new building, which gives them over 35,000 square feet of floor space.

FROM JAMES & CO., who have bought the Hardware business formerly conducted by F. L. Burris, at Irwin, Mo.

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FIGHTING THE CATALOGUE HOUSE.

BY A MERCHANT.

THE competitor that gives the retail merchant the most concern and the one with whom it seems hardest to cope is the mail order catalogue house. The local merchant does not fear his competitor at home, because money spent in town goes the rounds, and if he don't get it to-day he is reasonably certain of getting a piece of it sooner or later. On the other hand the money that goes to Chicago, for example, never gets into circulation at home. It may pay taxes and church dues and charity funds and go to support public enterprises, but if it does it will be in connection with foreign enterprises and the local situation will be none the better for it.

A Full Line.

By mail order houses we do not refer indiscriminately to the entire mail order business, but rather to those houses, noticeably in Chicago, who claim to be able to sell everything on earth at prices that cannot be met in open competition. The ordinary mail order business, devoted to exploiting some specialty, has no effect on retail trade, but the large catalogue concerns have come to be menacing in the extreme. This is true to a large extent in all branches, because they carry everything. It is especially true in the Hardware business and those lines which depend largely on the support of the rural districts.

Home Merchants Suffer.

A news item appeared in a Buffalo paper soon after the first of the year in which it was stated that during 1902 nearly $25,000 worth of goods had been received at the express and freight offices of a certain village of 1200 inhabitants in New York State from supply houses in large cities on orders from people living in that village and vicinity. In 1901 the people embraced in the same territory purchased $20,000 worth of goods from the same sources. This is a straw that shows which way the commercial breeze is straying. This village is only one of many whose people are spending their money in the same way.

Where Local Retailers Fail.

It is astonishing the hold these catalogue houses have on the rural communities. These houses have built up their business through persistent and judicious advertising. The local retailer has done nothing to counteract this pernicious influence, and by his very silence has created the impression that he is afraid of his larger competitors. His arguments, when he has condescended to cease abuse and come down to a reasonable discussion of the situation, have been mostly along moral lines. He has shown that it was wrong to patronize a concern that had no local interest; he has pointed to the fact that the goods were never better than represented and often of an inferior quality; he has shown where his money went in the way of local charities, &c., but where he has failed is in preaching too much on the moral side and leaving out the material side of the question.

Convincing Arguments.

If he had said he would meet the prices, dollar for dollar, goods for goods, it would have had more influence with the masses in a minute than a whole year's discussion of the moral ethics of where money should be spent. The average man is going to buy where he can buy cheapest, and the fellow who depends on getting a man's sympathy first and his money afterward might as well close his store. It is just as fair for the farmer and merchant to send to Chicago for his supplies as it is for the local merchant's wife to get her millinery in the nearest large city. The more the merchant whines over the catalogue houses the better they will be advertised. In fact the business has been built up largely by the crocodile tears of certain old fossils who marked their goods in war times and have never marked them down.

The only way to down any competition is to meet it squarely and go them one better. Advertising will kill the catalogue business just as surely as the mail order business has killed the old fossils, providing always it is backed up with the facts.

A Successful Advertising Campaign.

A certain Hardware store began an advertising campaign with a view of reaching those who patronized Chicago, and the results were very gratifying. Briefly their plan was as follows: They advertised that they had the catalogues of all the leading supply houses, giving their names, and offered the free use of them to any one interested. Each week they ran a series of descriptions of seasonable articles taken from the catalogues, giving the number of the article and the page, and quoted the catalogue price. Right below the catalogue price in bold type appeared the price charged by the local dealer. If it was less or more it did not matter; it was quoted just the same. Frequently, where a few cents over the Chicago article was charged, it was supplemented by a pertinent inquiry if 6 cents would pay the freight, &c. The introductory part of the advertisement usually contained some useful information that the consumer might well pause to consider. It was shown that the middle man's profit was not such a heavy tax as one might suppose, as, for instance, on a keg of Nails a jobber in Syracuse was quoted as saying that if he made 5 cents on a keg of Nails he was satisfied. Would 5 cents pay the freight on a keg of Nails from Chicago? Hardly. Then followed figures giving freight rates. It was shown that the man who bought a carload did not make so much more than the man who bought in case lots. It was pointed out that the earnings of the middle man was not so much on each article, but that it was the aggregate on a year's business. The fact was brought home that the freight in a small way was more than the jobber's profits, and even allowing that goods could be bought in Chicago at wholesale prices the freight and postage amounted to more than the middle man's profit, and the goods could be bought for less money at home.

Effect of the Advertising.

This kind of advertising was an innovation. The local paper commented on it. More advertising. Contemporary papers commented on it. Still more advertising. People talked about it. They were surprised that any dealer had the nerve to put his prices against the supply houses. They were incredulous, and said so, but they went to see, and the firm had life enough to show them, once they got them in the store, that there was no fear in their make up, and that they did not want money unless they could give value received for it.

This particular store found this the only successful method of dealing with the problem. True they were not always able to meet the price, but if not they were honest enough to say so and they offered to send to the catalogue house and get the article in question for their customers. As they were buying other goods in Chicago they were sometimes able to save a little freight by having the goods inclosed, and this was a small profit, better than none at all, and they had pleased a customer.

Premiums for Home Purchases.

The best way to fight a common enemy is to combine. If the dry goods man, the druggist, the grocer, the Hardware dealer, the harness maker and the furniture dealer would get together and do a little thinking it would be mighty profitable. Let them lay aside their petty jealousies and buy a little space and advertise. They could say to the people that they were ready to meet outside prices. They could press in the moral responsibilities of the good citizen to spend his money at home, and then go on to say that they were willing to offer a little premium in order to have him do so. They were prepared to fill all orders for goods in any line if they could get the orders. Let the people pick out just what they wanted from the catalogues, make up the order all ready to send and turn it over to them, and they in turn would agree to fill it at the same price and give them 3 per cent discount for cash.

Regaining Prestige.

This of course would mean that the consumer was to allow the local dealer the same as he would have to pay in freight and postage added to the catalogue prices. Local dealers could afford to do this, and it is not likely they would get many orders. If they did they should treat them fairly and promptly. The tendency, however, would be to discredit the catalogue houses, and by showing that they were ready to meet outside competition the local dealer would have taken a long stride toward regaining a falling prestige. All the world loves a fighter as much as they despise a sniveller. Don't whine, don't snivel, but hustle and fight and advertise.

FOREIGN TRADE.

BRITISH LETTER.

Offices of *The Iron Age*, Hastings House, Norfolk St., London, W. C., Aug. 8, 1903.

The Week's Hardware Trade.

AUGUST is always a dull month, and the present time is no exception to the rule. There is a marked slackness throughout the Midland factories, several of which are partially closed down. Oddly enough, the railroad traffic returns are up to average. This possibly indicates an increasing number of competitors for whatever business may be doing; it certainly does not contradict the actual fact that in most Midland factories trade is dull. In shop machinery, trade is not so good as at this time last year. The reason is assumed to be the reaction in the Cycle trade, which, though it has had streaks of activity, is on the whole still disorganized and flat. Good orders have recently been received for Rifling and Profiling Machinery and for Electrical Generating Apparatus. There is a good demand for Stocks and dies from South Africa. Gun makers are busy completing their orders for "the 12th," but the outlook is not at the moment promising.

From India and South America orders have come in freely for Edge Tools, but the Cuban trade in this department has been undermined by America. With Argentina at present trade is distinctly brisk, particularly in railroad materials, Galvanized Sheets, Wrought Iron Tubes, Lamps and Gas Fittings. Metallic Bedsteads and Electro Ware. Trade with Canada is maintained, but British manufacturers recognize that they do not successfully contend with American competition, notwithstanding the Canadian preferential tariff. Indeed, some assert that the actual incidence of this tariff helps Americans more than Britishers. Business with Australia continues restricted, but recent advices tell the glad tidings of refreshing rains, so that the outlook, particularly in New South Wales, is distinctly better than three months ago. The lower tendency in the price of copper is unsettling Indian orders, but yellow metal still goes out in good quantities.

Skilled labor is now easily available in the Spring Knife trade. For many months there has been a scarcity of labor in this department, to which I have several times alluded. The reason for this change is the sudden stoppage of Government contracts after the South African settlement. Sheffield firms for the past three years have been working under the greatest pressure making Clasp Knives, Razors, &c., suitable for troops at the front. These firms have now received notice of termination of contracts, with the result that a small army of cutlers and grinders have been thrown upon the ordinary competitive labor market. Bearing on this, it may be recorded that Sheffield manufacturers ascribe the recent increased cost of production in those lines to the substantial wage advances made to cutlers and grinders—advances which represent not less than 10 per cent., as compared with two years ago.

The Scissors Trade.

A Sheffield industry which finds itself seriously affected by German competition is the Scissors trade. Many of the smaller makers import German Scissor blanks, then make them up and market them as "Sheffield made." One or two large manufacturers are now erecting plants to stamp their own blanks for the commoner class of Scissors, and so are independent of the German article. The smaller firms still buy from Germany. Apart from the blanks, German Scissors still make headway in this country, and in the general *entrepôt* trade.

Nails and the Preferential Tariff.

There is nothing like a discussion on fiscal questions to divide up hitherto undivided families. A case in point is the Chamberlain family. While Joseph Chamberlain, the Colonial Secretary, is busy preparing an autumn campaign, his brother, Arthur Chamberlain, is equally strenuous on the other side. Arthur Chamberlain is *par excellence* the business man of the family. He is a sort of financial dictator in many departments of the Midland iron and Hardware trades. He is an adept at amalgamating competing concerns, and must be much wealthier than his more famous brother. Naturally, the free traders are booming brother Arthur, who seems to be as capable of plain and convincing speech as the Colonial Secretary. The following letter, therefore, written by Arthur Chamberlain, has a piquant interest all its own:

"I see some anonymous correspondent has been writing on the subject of Wire Nails, and suggesting that because our foreign competitors are able to sell the commoner qualities in our markets cheaper than we know how to make them we ought to be protected by a tax.

"Now, as chairman of Kynoch (Limited), who manufacture Wire Nails, I am interested in this question, and do not admit the right of anonymous correspondents to speak for the trade.

"On behalf of my own company, and on behalf of any manufacturer who is fit to be in the business, I altogether repudiate the suggestion that we need protective tariffs, or would benefit by them.

"My company have always done a good business in the better qualities of Wire Nails, both for home and export, and that business we are increasing year by year.

"It is a fact that we have not yet been able to compete in the commoner lines, but I no more attribute this inability to unfair competition on the part of the foreigner than I attribute their inability to compete with us in some other lines to unfair competition on our part.

"Similar cases have come to my notice before, and I have invariably found the explanation of the foreigner's success to lie either in some natural advantage or—and this is more often the case—in wiser methods of business.

"I have no doubt that before very long the able men who serve my company will have discovered the secret of cheap Wire Nails, and we shall then add that line to the many others we have captured from worthy competitors.

"Meanwhile, if the knot is to be cut by making all England pay more for its Wire Nails, you take away from inventors the incentive to invention and reward the dullards for their dullness."

Municipal Competition.

I propose, in a few weeks' time, to discuss some of the difficulties met with by the retail Hardware trade, particularly in regard to outside competition. Not the least important of these outside competitors is the local administrative body, whether it be the City Council, the urban District Council, the rural District Council or the County Council. Attempts have been made to curb the powers of local bodies, but hitherto without success. Politicians do not care to face the dangers involved in opposing such a popular movement as municipalization. Thus it happens that bit by bit some item of trade hitherto done by the local Hardwareman is absorbed into the activities of the Municipal Council. Two events have happened this week which vividly show the process. The Teignmouth Urban Council this week decided to apply for powers to borrow £2000 for the purchase of Slot Meters and Stoves. The Council own their own gas works and this is to stimulate demand for the gas.

More important and significant is the case of a protest made in the Birmingham City Council against proposed competition with local tradesmen in the matter of Gas Stoves. The Council proposes to lend free of cost small Stoves to small consumers. The gasfitters and ironmongers naturally strongly object to the discontinuing of the hire charge, for it of course precludes the private trader from pursuing this branch of his business. What follows is best told by the report of the proceedings:

The Lord Mayor said that there was no new principle involved in lending small Stoves. If he thought that the gasfitters were at present supplying the Stoves, and that it would take away their trade, he would not vote for it, but he was not so convinced, and did not see that any hardship would result. Mr. Bishop, replying on the discussion, stated that the corporation had never really increased their fitting department beyond the natural growth of the concern. The committee had never decided to compete with the gasfitters, and there was a false impression that they had hindered the traders. They had information which showed that the consumer, whom they were endeavoring to serve, did not, and in many cases

could not, find the money necessary to purchase a small Stove. In the end the proposal was adopted.

I think it is only fair to add that in fact this particular trade has really been developed by the public authorities. Gas Stove manufacturers aver that they only met with discouragement when they attempted to push their trade through the usual retail channels. The moral would seem to be that if you would prevent municipal authorities from cutting into any branch of your trade you must be progressive and thorough before and not after such unwelcome competition.

Stoppage in Tin Plate Trade.

The trouble in the tin plate trade, to which I have already alluded, has come to a head. Before August has ended it is anticipated that 300 out of 360 active tin plate mills will be lying idle. The employers claim that "Canadas" and "doubles" should be paid for on the recognized standard area of a box of tin plates. The men object, hence these tears. It is hoped by the masters that as the American mills are busy a settlement may be reached without much delay. The men emphatically state that they will only go in to work on the same terms as last year's settlement.

Prospects in Mexico.

Reports in this country as to the condition of trade in Mexico are encouraging. The high rate of exchange has tended to stimulate domestic manufactures in many important lines, while the Mexican Government has made some efforts to encourage exports, with a view to reducing the unfavorable balance, payable in gold. The average annual amount of imports into Mexico—that is, the whole country—during 1893-95 was $35,000,000; 1898-1900, $50,000,000. The proportion from Great Britain during 1893-95 was 17 per cent., and during 1898-1900, 18 per cent. From Germany during the periods mentioned, 8 and 11 per cent. respectively; from France, 14 and 12 per cent., and from the United States, 52 and 49 per cent.

The total value of imports into Mexico during the fiscal year 1901-02 was approximately $65,000,000, almost the same as in 1900-01, and the proportions were as follows: Great Britain and Colonies, 13 per cent.; Germany, 10 per cent.; France, 10 per cent., and the United States, 58 per cent., followed by Spain with 4 per cent. and Belgium, Switzerland, Italy, Austria-Hungary and Holland in the order given, with 5 per cent. between them and "other countries."

The decline of British trade is the most marked. In 1901-02 the imports from Great Britain and Colonies were valued at $8,365,000, against $9,924,000; in 1900-01, a loss of $1,559,000. Germany follows with a fall from $7,080,000 in 1900-01 to $6,450,000 in 1901-02, a difference of $630,000. France comes next with a decrease of $280,000—that is, from $6,565,000 in 1900-01 to $6,285,000 in 1901-02.

The trade of the United States increased from 54 per cent. in 1900-01 to 58 per cent., in 1901-02—that is, from $35,200,000, to $37,400,000, a gain of $2,200,000, almost exactly the value of the trade lost by Europe.

AUSTRALIAN NOTES.

FROM A SPECIAL CORRESPONDENT.

MELBOURNE, July 13, 1903.

FROM "down under" comes a more cheering report than might have been expected. Weather reports have been of the most hopeful nature, and the commonwealth balance sheet for the year ending June 30, 1903, is an eminently satisfactory document. Customs and excise revenue have yielded £9,680,000. This is over £600,000 more than the estimate, and is largely due to the unexpected receipts from the sugar and the fodder duties. Of the total revenue £8,200,000 is returned to the various States, being about £890,000 above the estimate, made up of about £300,000 savings, the balance of £590,000 being excess receipts. The above figures are eminently satisfactory, and when Australia learns sufficient good sense to adopt some scheme of ear marking some portion of revenue to provide a sinking fund for the gradual extinction of our debt to outside countries we may hope for systematic progression.

The State of Victoria has shown a surplus of £153,000 in her public finances this year, for the first time for many years.

At present the State Ministry are in secret conclave on matters which have not yet been even hinted at to outsiders. It is believed some new scheme of assuring the prevention of the financial drift of recent years is under discussion.

To deal with the Hardware trade solely it is to be noted that Inter-State trade shows no improvement as yet. Victorian trade for the coming year will depend largely on the weather of the next few months. So far prospects are excellent, and with ordinary spring rains a good harvest is assured. But country traders are acting with extreme caution, and are deferring ordering, although their stocks are running low.

Engineers and iron founders are still working short time, and Farm Implement makers are doing little, except a couple of firms who are busy on "Complete Harvesters" for export to California and the Argentine. Builders' ironmongery is quiet, little else but small contracts going.

The Westralian gold output for June, 1903, was the third highest on record, being 208,059 ounces, equal to 176,332 ounces of fine gold, valued at £749,014. The total output for the first six months of the current year was 1,221,755 ounces, valued at £4,398,352. The increase for the half year as compared with a similar period in 1902 was 186,000 ounces. The savings bank deposits in this State are also steadily increasing, being at date of the value of £1,940,000—a healthy amount for a population of only 114,000.

The country is rapidly being won over to agricultural industry, and there are large numbers of what are known as "small shows" on the mining fields.

By "small shows" are meant gold mining claims worked by a few men, principally on the share system. Numbers of them are yielding from £200 to £500 per annum per man. Many of them would bear legitimate development, but the investing public have been so badly bitten by the "wild cat" companies which have of late years made Westralia their special hunting ground, that they are shy of further speculation in this field. The retail Hardwareman in the interior of this State benefits in some degree by reason of the many small "claims" as against the few large companies, for the reason that the latter usually indent their requirements in large quantities through London merchants to the exclusion of local trade. The "small shows" naturally buy locally, giving the country retailer and the city wholesale house each a chance to live.

Some of these little weatherboard country stores show curious jumbles of stock under the one roof. American Axes and Hammers fraternize side by side with cases of drygoods and edibles of all sorts. Competition is pretty keen, because the population is small, and many wholesale houses from the Eastern States compete for whatever is going.

Mr. Wood of Rotherham, Wood & Co., of Melbourne and Sydney, left Australia a fortnight ago for a trip to England, and very probably to America. Rotherham, Wood & Co. represent many American houses, notably the Reading Hardware Company, the Ohio Tool Company, North Bros. Mfg. Company and others.

The official stock returns for New South Wales during 1902 are just to hand. Losses in stock have been the usual thing for many years past, but 1902 caps the lot. According to official figures, which are very probably short of the actual total, the losses in sheep for the one year alone were in round figures over 15,944,000, and in cattle over 430,000. New South Wales now possesses less than 26,000,000 sheep, not very much more than one-third of what she carried ten years ago. Sheep are the chief national industry of this State, and two-thirds of the capital invested has actually gone into "thin air."

McLean Bros. & Rigg, Limited, whose name is no doubt as well known in New York as in Melbourne, have

abandoned their large establishment in Elizabeth street, Melbourne, and taken temporary premises in Lonsdale street for the clearance of their stock. They certainly made large reductions in prices during their sale, and still have a huge stock left to get rid of. Their selling off did not have so severe an effect on other traders as was anticipated. In fact, it almost seemed to stimulate trade in some quarters.

If American trade is going to get a good hold in New South Wales there must certainly be a marked improvement in the time of deliveries, and at least a distinct understanding that when a c.i.f.e. order is given for goods a period of 18 months should not elapse between the date of giving the order and the receipt of the goods. I heard a leading merchant the other day complain bitterly of an order for Enameled Ware, which at the time was on the way. No doubt when low prices are given and accepted, and that a c.i.f.e., the manufacturer simply waits his freight and must cut out his low quote somehow, but this sort of treatment will never introduce new business. On good, established lines well known here there is no necessity for this, as steamer freights follow the car (if from inland), and the goods will stand it because they are wanted and ordered; but where the order is wanted the position is quite a different one, and the question seriously to be entertained by competitors in this market is whether each separate shipment is to be made a distinctly paying one. If this is to be the rule, the idea is that new lines will be hard to introduce here. The Germans are making a bid for Copper Sheets and Tubes, also Brass, and have secured some decent orders for the first. The goods have not arrived in good order, in some instances the Tubes and Sheets being in skeleton cases, very strongly made; but whether the damage would have happened to the Tubes had they been cased ordinarily it is hard to say. In one case I saw about 20 feet of 3-inch Tube only fit for old copper. I think that where practicable all packages should cover the contents, as risk of damage by salt water and loss by pilfering (though in this case pilfering could hardly take place) is less. It seems to me if the Germans can introduce Copper Tubes and Sheets here that the Americans should, but, of course, if the deliveries are not to be in reasonable time and properly regulated in the event of a split shipment order being taken, then it is useless trying to get a footing, as I understand that up to the present no business has been done with New South Wales in these goods. The size of the Sheets and gauges of the Tubes are matters purely of detail, most of the former being 8 x 4 feet, and the gauge of the Tube being sufficiently thick that the standard gas threads may be put on according to size, a good deal of our Pipe being fixed that way. The trade, if it can be done by you, or even a part of it, is a good one and well worth trying for.

Lead Washers are coming in from your side, and at a low price, too. No doubt this comes under your export rates, and this will account for it. Some of the local makers complain of the rate, but no doubt will meet it somehow, as in other matters. The demand for these is, of course, not extensive, as the Spring Headed Nails are very largely used.

We had a trial of a patent Coal Cutter in our mines a couple of weeks ago, and it seems that in some positions it is a success, while in others the hand methods are easily first. I suppose that in the course of a month or so some figures will be published of a comparative character, so that an inference as to cost of hewing could be drawn.

S. B. LAFFERTY, general manager of the Red Jacket Mfg. Company, Davenport, Iowa, with his family, has been spending the past few weeks in an outing on the Atlantic Coast. While East Mr. Lafferty has taken the opportunity to look after the Red Jacket Pump trade in that section of the country. The demand for their "So Easy to Fix" Pumps in the East has, we are advised, been very large this year. Mr. Lafferty has also been directing the attention of the trade to several new Pumps which the company are bringing out.

THE TRAVELING SALESMAN HIS METHODS AND CONTROL

CHAPTER XXVII.—THE MANUFACTURER'S SUPPLY SALESMAN.

IN a general way, the methods of managing the salesmen of a factory supply house, or of the factory supply department of a wholesale Hardware house, differ but little from those employed with the men who visit Hardware dealers, the main difference lying in the character of the goods and the occasional opportunity for competing for contracts with monthly deliveries extending over a whole year.

Remuneration.

The commission paid is about the same as to the trade salesmen when it applies only to orders taken in person by the salesman. When he is credited with the large contracts which he assists to secure and is paid a commission on all specifications applying thereon the percentage is generally cut to a figure that will bring his remuneration to about the same amount as the good trade salesmen.

No Local Jealousies.

In the best manufacturing districts a salesman who covers well 20 towns does all that can be expected. He is not bound by the same limits that affect the trade salesman, who finds local jealousies a bar to many a good account, for the manufacturer buys for consumption, and the fact that other manufacturers in the town patronize the same house is a matter of indifference to him, if not an argument in the salesman's favor. Indeed, the salesman can often interest the factory buyer in a line by telling of a sale to a neighbor who considered the goods unusually good or unusually cheap.

Personal Relations.

The personal element, which is a very important factor in every middleman's business, is never so largely of influence as in the factory trade. With his smaller line to buy, the factory purchasing agent has more time to weigh matters and there is more of an opportunity to sway him by friendship or personal favors. In a certain large establishment doing business in the Middle West it is the custom to permit salesmen to make Christmas presents to the buyers, whose favor can be thus secured or retained, and the presents all go to the buyers in factories. It is the salesmen for the factory supply department, and they alone, who are allowed an extra expense fund for the entertainment of buyers, and it is in factories where the buyers are friendly that the salesmen have a chance to get into the shop to talk with foremen and storeroom men and learn the exact quantity of material in hand of the various lines they have to sell.

The Social Side.

The business is upon so different a basis that there can be an exchange of courtesies between the buyer and seller which cannot exist in the Hardware trade. If a salesman invites a buyer to lunch with him it is very possible that he is but repaying a like courtesy extended to him upon a previous visit. When the time for the letting of big contracts is at hand the salesman is often reinforced by the man from the factory whose goods he is selling, and sociability is a matter of course, or it may be that some one in authority in the jobber's establishment comes out to supplement the salesman's efforts, and there is an exchange of courtesies between the heads of the houses in which buyer and salesman join, without any business injury to either house's interest. There are times, however, when the salesman of the maker of the goods who has assisted to land a contract makes so favorable an impression that he is invited to bid direct the next year, and if he is not loyal to his agent trouble results.

Freedom of the Shop.

In some shops, employing large numbers of machinists, the factory supply salesman is given free access to the shop in order that he may take orders for tools from the workmen. He ships the goods to the customer and bills them to him, and he in turn collects from his men.

Such a trade does not in itself amount to much, but it often paves the way to a favorable report on a brand of tool steel or drills or other goods for which large orders are taken. It is always a good thing, too, for an observant salesman to have an opportunity of seeing how the stock is of Belting and Shafting, Files and Hammers, Drills and Tubing, and other articles he may have to sell, and to make the personal acquaintance of the man in the factory upon whose requisitions supplies are bought.

Good Goods Essential.

The factory supply salesman who succeeds must have a good line of goods. Brands which represent the best in quality are the strongest recommendation to favor he can have. Everything receives a test in use, and must be as represented, and nothing will set him right in the factory if his goods are continually found unsatisfactory. The exact grade of the goods must be clearly stated and thoroughly understood. One of the things hardest to fight is the predilection of workmen who are accustomed to goods of one brand to consider anything else as inferior. The better known his goods are the easier it is to get the workmen to accept them as satisfactory.

Hard to Begin.

It is much more difficult to create a good factory supply route than any other. A year will suffice to get a new salesman started with the Hardware trade in a new teritory. It may take four or five to develop a paying factory supply route, largely because the personal element is given such prominence, but when a route is well established it is the best paying trade that a jobber can have and upon which he can place most dependence.

Trouble with Dealers.

As a usual thing, the jobbers who have a factory supply trade are those who began with a retail store and sold factory supplies before they became wholesalers. It is hard for a jobbing house without such a trade established to embark in this branch, for so soon as his men visit the factories of a town the local dealers will complain, and he will be given the choice of abandoning the factory trade or that of the dealers. After he once gets firmly established with the factories of a manufacturing town he can afford to abandon the Hardware trade if offered a choice, for his factory customers will yield a greater business with better profit.

Hardware Salesman's Sentiments.

The man who visits the Hardware trade has no desire to see his employer send a man to solicit the factory trade in his territory, for it means trouble for him from start to finish. The retail merchant will object seriously to the jobber's inroads on his factory business. Occasionally the factory supply salesman, having lower prices on some lines because of the greater quantities he sells, will quote a factory a price considerably lower than quoted the dealer by his trade brother, and this gives an occasion for trouble. In fact, there is trouble continually, and the more successful the factory supply man is the more trouble the trade salesman will have.

JOS. F. M'COY COMPANY'S JOBBERS' CATALOGUE.

JOSEPH F. McCOY COMPANY, 157 Chambers street, New York, importers of and dealers in foreign and domestic Hardware, Cutlery, Chains, Tools, Machinery and Railway Supplies, have issued section J of their illustrated catalogue, designed for the large jobbing trade. This book contains lines of goods they control of American manufacture and foreign goods for which they are headquarters. They represent as sole agents the Monarch Cutlery Company and Irving Cutlery Company, Pocket Cutlery, Razors, Scissors, Farriers' Knives, &c.; Irving Mfg. & Tool Company, Pliers, Pincers and Tools; Warrington Shear Company, Warranted Shear, Scissors, &c.; Peugeot Freres, Lion Band Saws and Tools; Gueutal & Sons, French Pliers and Jewelers' Tools; Tangyes, Limited, Hydraulic Jacks and Blocks; Wm. Eades & Co., Differential Pulley Blocks; Weiller & Co., Brass Wire Cloth; Marty & Vidal, Bolting Cloths; F. Parker & Sons, Needles, all kinds, and Springfield Machine Screw Company, Revolving Punches, Hack Saw Frames, &c. They are likewise headquarters for Geo. Wostenholm & Sons, Pocket Cutlery and Razors; Wade & Butcher, Razors, Tools, &c.; Elliott & Johnson, English Razors and Blanks, Weston's Pulley Blocks and Ratchet Drills and Chesterman's Measuring Tapes and Rules.

PRICE-LISTS, CIRCULARS, &c.

THE BECKLEY-RALSTON COMPANY, Chicago: Annual Catalogue No. 31, which is devoted to standard Bicycle Material and Sundries, Machinists' Tools, Motor Cycle Sets, Automobile Supplies and Hardware Specialties. The catalogue is profusely illustrated, and shows a complete line of supplies.

THE ETNA MFG. COMPANY, 253 Broadway, New York: Special illustrated circular describing their new Clock Spring Tempered Back Hack Saw Blades. They state that the Blades are manufactured by their new process whereby the tooth edge only is left hard, while the back is drawn to a Clock Spring temper, permitting the Saw to bend without kinking or breaking readily, giving the user full efficiency until the teeth are worn out.

THE MILWAUKEE TACK COMPANY, Milwaukee, Wis.: Illustrated catalogue and price-list of a full line of Tacks, Nails, Slivers, Clinching Rivets, Escutcheon and Dowel Pins, Double Pointed Tacks, Staples, Rivets and Burrs, Tin Washers, &c. A view of the company's factory is given in the front of the book.

THE BARLOW MFG. COMPANY, Holyoke, Mass.: Illustrated catalogue of display Fixtures for store interiors and show windows. This catalogue supersedes all other catalogues and lists.

THE AMERICAN BELL & FOUNDRY COMPANY, Northville, Mich.: Catalogue No. 9, devoted to illustrations, descriptions and prices of Church, Chapel, School and Court House, Fire Alarm and Fire Bells.

THE TENGWALL FILE & LEDGER COMPANY, 1406-1414 East Ravenswood Park, Chicago, Ill.: Catalogue and price-list devoted to "Tengwall Time Savers." The company make loose leaf devices (covers and sheets) from the bottom up. These include Ledgers of various kinds, Indexes, Ledger Leaves, Price Books, Files, Perforators, Scrap Books, Music Folios, Invoice Books, Music Files, Photograph Albums, Binders, Vest Protectors, &c. The loose leaf system, it is remarked, is rapidly growing in favor with the trade.

THE STANDARD PAINT COMPANY, 100 William street, New York: "A Ruberoid Album." This is a book of 47 pages illustrating buildings upon which Ruberoid roofing is used. The covers of the book are in imitation of the roofing.

THE BOSTON BELTING COMPANY, Boston, Mass.: Catalogue illustrating, with prices, Rubber Mats, Matting and Treads. Matting is shown corrugated. A large number of styles of Perforated Mats and Door Mats are illustrated, also Treads for various purposes. Brass Stair Nosings, for use in connection with Rubber Stair Treads, and Rubber Binding for holding the ends of Rubber Matting down in place are included in the catalogue.

THE R. HEINISCH'S SONS COMPANY, Newark, N. J.: Illustrated catalogue and price-list of the company's complete line of Tailors' Shears, Straight Trimmers, Bent Trimmers, Tailors' Points, Barbers' Shears, Scissors, Office and Bankers' or Paper Shears, Electricians' Shears, Glass, Candy and Rubber Shears, Button Hole Scissors, Roaching, Pruning and Dental Shears, Tinners' Snips and Button Hole Cutters.

HIBBARD, SPENCER, BARTLETT & Co., Chicago, Ill.: A number of inserts for their new loose leaf catalogue. Included, for insertion at the end of the catalogue, is an approximate price-list, giving figures on everything in the catalogue except a few staples. Subject to market changes, the figures are not what the concern would charge for the goods, but form a basis from which merchants can figure for a profit. The prices are so made as to form an estimate on any goods which are not carried in stock by retailers, when merchants do not have time to write for exact quotations.

SARGENT & CO.'S SHORE DINNER.

THE heads of departments of Sargent & Co., New Haven, Conn., to the number of 40 enjoyed an elaborate shore dinner at Cox's Surf House on Wednesday evening, August 12. The affair was marked by a cordiality of relations between the employees and their officers which did credit to both. J. B. Sargent, head of Sargent & Co., as well as his two sons, Henry B. Sargent and Edward R. Sargent, participated in the affair, and the utmost good feeling prevailed. As early as seven o'clock the party began to assemble on the spacious portico of the Surf House, overlooking the waters of New Haven harbor on Long Island Sound. Leroy J. Kirkham, Frank W. Willoughby and Jas. A. Hughson, the Reception Committee, welcomed each arrival. Promptly at 7.30 the party marched from the portico to the dining hall, where a great surprise awaited them. At each plate was found a beautiful imported silver topped Stein, intended as a souvenir of the occasion. The blue and gray Steins with their shining silver covers formed a pleasing contrast to the numerous bouquets of yellow golden blows and ferns with which the tables were abundantly decorated. The party remained standing while singing "America," after which the chairman, H. H. Weed, called the gathering to order.

During the dinner and until late in the evening there was a constant flow of good humor, the singing, toasts and selections by Cox's Orchestra being much enjoyed. Several songs were composed for the occasion by W. H. Wright, a member of the General Committee, and all of

them made a hit. To give an idea of their character and spirit we give below the song, entitled "To All," which was rendered to the air, "Marching Through Georgia;"

Again we meet together, boys,
As jolly as can be;
Again we'll try a dinner
In the "Cottage by the Sea."
A discontented crowd of men
We'll never, never be,
While we are working for Sargent.

CHORUS.

Hurrah, hurrah, this night we'll merry be,
Hurrah, hurrah, now sing out lustily;
And so we'll sing the chorus
In the "Surf House" by the sea,
While we are working for Sargent.

The Sargent men are winners,
Of this there is no doubt;
And when we're at our dinners
We must not forget to shout;
Glory Hallelujah,
Let us have another bout,
While we are working for Sargent.

At the conclusion of the dinner E. E. Lord, as toastmaster, in his happy fashion, introduced the speakers. Mr. Sargent, besides giving some good, sound advice to those present, told some amusing stories of former dinners, when the force of department heads was not so numerous as upon this occasion. Other speakers were G. T. Smith, F. W. Fellows, H. B. Sargent, W. H. Kirschner and J. H. Shaw. Upon being unanimously called for Frank P. Ryan, representing the Coffin Trimming department, in a few witty illustrations, showed he was much alive on this occasion.

Those present at the dinner were the following: J. B. Sargent, E. R. Sargent, Henry B. Sargent, J. H. Shaw, Chas. Bradford, Frank West, E. E. Lord, H. H. Weed, Aug. D. Baker, F. J. Chatterton, J. B. Freysinger, Daniel Allen, Julius Bitterlich, Chas. Cutts, W. Loveland, E. S. Vintee, J. A. Hughson, W. H. Kirschner, Wm. Bailey, L. J. Kirkham, P. J. Falsey, Bruce Fenns, W. A. Rice, G. T. Smith, Fred. Fellows, R. MacArthur, John Perrie, M. J. Mara, M. F. Campbell, W. H. Bradley, F. W. Willoughby, Chas. Wagner, Theo. Kapitzke, Newell L. Taylor, A. R. Kirschner, W. H. Wright, R. Shephard, H. F. McCollum, F. P. Ryan and J. W. Scott.

The *menu* and programme for the occasion were inclosed in a unique folder representing a Stein overflowing with the products of this great concern. This interesting and creditable folder was designed by J. B. Freysinger, a member of the General Committee. These social dinners (this being the second this year) are creating such good feeling and fellowship that it is not unlikely that another will be held in the near future.

AMONG THE HARDWARE TRADE.

Buck & Whitcomb, Palmer, Mass., have been succeeded by Whitcomb & Faulkner, the partners being Cecil I. Whitcomb, formerly associated with G. E. Buck, and R. E. Faulkner, formerly of Keene, N. H. They will continue the retail business in Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, Sporting Goods, &c.

Smith-Rogers Hardware Company, wholesale and retail, Glasgow, Ky., have recently been reorganized, and Ernest Ousley elected vice-president and manager. The stock now carried will be enlarged and new lines added.

H. D. Cowles of Mills & Cowles, Olympia, Wash., and E. K. Reynolds of the same firm, have purchased the business of the Washington Hardware Company, Tacoma, Wash., which will be continued under the same style as heretofore, Mr. Cowles being president and Mr. Reynolds secretary of the company. The store will be entirely remodeled and the stock materially increased. The company carry a stock valued at about $30,000, and conduct both a wholesale and retail business. They handle Builders' Hardware, Mechanics' Tools, &c., and will shortly add a line of Sporting Goods.

Fred. John & Co. have bought the Hardware, Stove and Sporting Goods business of E. T. Frederick in Gowrie, Iowa.

R. W. Wisemiller has disposed of his business in Carmen, Ok. Ter., to Cyclone Hardware & Implement Company, who will continue at the old stand.

Charles Stoltzman has purchased the interest of Mr. Schultz in the Hardware firm of Schultz & Neiburg, West Point, Neb., and the style has been changed to Neiburg & Stoltzman.

The Marti & Sampert Company, who own a Hardware store and lumber yard at Lake Benton, Minn., have dissolved. B. B. Marti will hereafter conduct the Hardware business under his own name, his former partner devoting his attention to the lumber end.

Porter & Coziah have succeeded Waterman & Porter in the Hardware, Stove, Farming Implement, Sporting Goods, Buggy and Wagon business at Grant, Iowa.

THE WILCOX MFG. COMPANY, Aurora, Ill., have found the demand for their Door Hangers and Hardware Specialties crowding them for some time past, and to enable them to keep pace with their orders have just closed a contract for an additional building, work on which will be commenced at once, and which when completed will give them 12,000 square feet of additional space. The dimensions of the new building will be 80 x 150 feet.

ARRANGING A STORE WINDOW DISPLAY.

BY GILES HUNTER.

NO more encouraging thing can be said of window dressing in small Hardware stores than the fact that the most attractive and best paying windows are the simple ones. One hundred dollars' worth of goods crowded into a window with expensive fixtures will be forgotten by the passing public much sooner than they will forget a large doll dressed like a boy, with cap and mittens, carrying a "shinny" stick and wearing a pair of Wooden Skates, painted to resemble steel and whittled out by your clerk, because the factories make none small enough, and standing on a piece of mirror, surrounded by cotton batting on which are displayed different styles of Skates.

SHELVING, ETC.

Shelving on the side wall of the window is not so good as Poultry Netting stretched over the wall and extending to the ceiling, on which to hang Granite and Enamel Ware. This arrangement neither catches the dust or takes up the room that shelving does, besides fewer goods are required to give the wall a well filled appearance. A shipping tag pasted to the back of a Granite Dish makes a good hanger. Hooks placed on the side wall of the windows, on which to hang Carpet Sweepers or Saws or Steel Goods at different times, make a good appearance without waste of room.

FLOOR COVERINGS.

A rug for the bottom of the window is better for showing Stoves, Refrigerators, &c., than is either carpet or oil cloth. A piece of plain, black cloth of good quality and without seam makes a good surface on which to display Cutlery, Tools and Bright Goods of any kind. It is well to have three or four different colored coverings for this purpose, for they have much to do with the success of your window. Five to $10 invested in a large mirror, with a very narrow frame of your own making, to set at the back of the window when Tools or other small goods are arranged on the flat surface of the cloth, is a good investment.

DISPLAY ONE ARTICLE

By confining each display to one line of goods and not overcrowding, it will not be a serious task to clean and change once a week, or once in two weeks, at most. No matter how well any particular effort pleases the public, don't let it stand more than two weeks, for by that time the glass will need cleaning on the inside, regardless of how many times you have cleaned it on the outside, and no soiled window can be a good window.

LIGHTS.

After a variety of experiments with artificial lights for windows we are the best pleased with one large arc light, hung in the doorway, outside of the door and no higher than necessary to clear the tallest man with the tallest hat. The sidewalk is then well lighted, you are a "shining mark" for a block away, and if the glass is clean there is no brighter front on the street. There should be one or more arc lights inside the store to complete the effect, and they should be lighted whether the store is open evenings or not.

KEEPING FROST OFF THE WINDOW.

A piece of ¼-inch brass pipe, with very small holes about 3 inches apart drilled into it and bent to fit the sash at the bottom of the window, closed at one end and attached to some gas fixture or pipe at the other by means of a flexible tube, will, when lighted, make a row of small lights at very small expense that will serve the double purpose of making a very attractive invitation to look in at night and of keeping the frost off the window in the day time, except when the thermometer goes very low, say 15 to 20 degrees below zero.

SPECIAL DISPLAYS FOR HOLIDAYS.

Holidays and special events furnish good suggestions for window dressing, such as a stuffed turkey, surrounded by Roasting Pans, at Thanksgiving time. Or get a turkey skeleton from your hotel, wire and glue it into shape, and show on a platter, which is the center of a circle of Carvers, with a card calling attention to the kind of work *your* Carvers will do.

MISCELLANEOUS NOTE.

Handy Tool Chest.

The American Tool Chest Company, 200 West Houston street, New York, have recently brought out the Handy tool chest No. 1903 for house and farm use. The chest is 27 inches long, 8 inches wide and 4 inches deep. It is made of bass wood with dovetailed corners, and has a partition inside. There is a total of 18 superior quality tools, we are informed, consisting of a panel saw, iron block plane, bit brace, four auger bits, nail hammer, rule, cutting pliers, hatchet, screw driver, spirit level, screw wrench, saw file, oil stone and oil can and set of 10 awls and tools. The company call special attention to their large and complete line of tool chests, with and without tools, for boys, youths, amateurs and professionals, for the holiday trade.

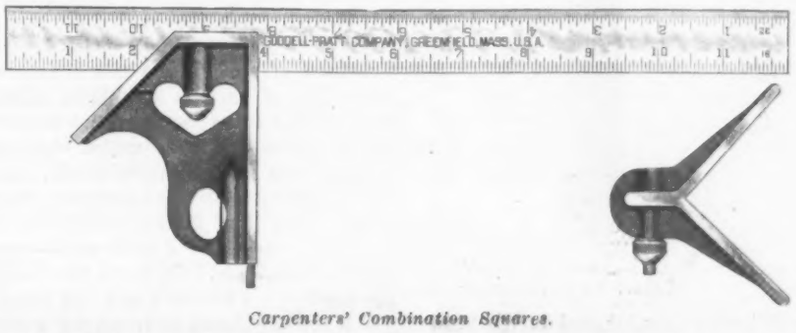
Fairchild Adjustable Screw Driver.

Wiebusch & Hilger, 9-15 Murray street, New York, are placing on the market the Fairchild adjustable screw driver, here illustrated. This article is packed in sets consisting of one handle and three different sized blades, the various blades being interchangeable in the same handle and held in place by a metal plate in the butt end. The blades are made of best tool steel and are warranted by the house neither to break or bend, and the handles are guaranteed not to split. A light tap on the butt end of the handle loosens the blade, so that it can be instantly removed in order to insert a blade of another size. A point made in its favor is that it has neither springs, screws nor nuts to get out of order.

Fairchild Adjustable Screw Driver.

Carpenters' Combination Squares.

The Goodell-Pratt Company of Greenfield, Mass., are putting on the market a line of combination squares for carpenters' and general use, as shown herewith. The manufacturers describe them as accurately made and

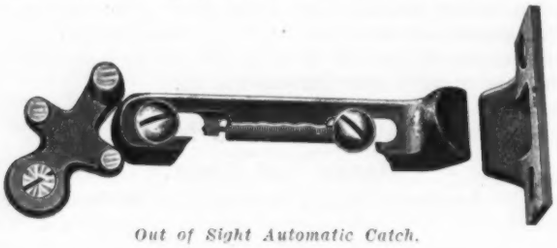


Carpenters' Combination Squares.

nicely finished, and furnished in either 9, 12, 18 or 24 inch length, with or without center head, as may be desired. As regularly furnished they are graduated in 8ths, 32ds, 12ths and 48ths, although when required they are furnished in 8ths, 16ths, 32ds and 64ths. The manufacturers give the assurance that the squares are of their usual high standard of quality.

Out of Sight Automatic Catch.

The O. C. Little Pulley Coating Company, Menasha, Wis., are offering the automatic catch shown herewith, the illustration being cut away to show the manner in which the spiral spring is secured. The catch is designed for use on cupboard, screen and storm doors. When used on single cupboard doors where there are no shelves the catch is placed horizontally, as shown in the illustration. When used on cupboards where there are shelves the



Out of Sight Automatic Catch.

catch is put on vertically with the stop plate placed under the edge of the shelf. When used on double doors the catch is also placed vertically and no strip is required between the doors. The locking device, shown at the left of the catch, is required only in connection with screen or storm doors, the catch being placed horizontally. The manufacturers remark that the catch is simple to put on, that no part of it shows on the outside of doors, that there is no knob to turn or push in opening, that the bolt releases itself by a slight pull on the door knob, and that the catch is not affected by the shrinking, swelling, warping or sagging of doors.

Bill Posters' or Advertisers' Hammer.

The combination hammer with magnet handle shown in Fig. 1 has an 8-ounce magnet head and jointed handle

Fig. 1.—Bill Posters' or Advertisers' Hammer.

Fig. 4.—Small Horseshoe Magnet Tack Hammer.

of two sections, each 18 inches long. Fixed in the head of the handle and projecting through the eye of the hammer is a magnet, which can be used to hold a tack in position to be driven upward into a ceiling. The hammer head is removable, allowing the handle with its magnet to be used separately as a pole for hanging card posters and banners from ceilings, window sashes, &c. Attached to the handles is a spring for holding card to set first tack. In Fig. 2 is shown the butt section of the

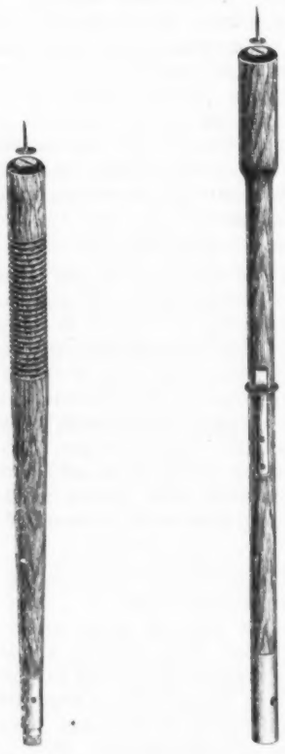


Fig. 2. Fig. 3.

The Magnetic Handle.

jointed magnet handle, while in Fig. 3 the tip section of the jointed magnet handle is illustrated. The hammer head and all trimmings are nickel plated, giving the tool a handsome appearance and preventing rust. The small horseshoe magnet tack hammer shown in Fig. 4 is referred to as a superior tool for house or shop use, and is intended to retail at a moderate price. The head has a bright finish, wth a handle 12 inches long. The hammers are made by Arthur R. Robertson, 144 Oliver street, Boston, Mass.

A WINDOW DRESSING IDEA.

WE are in receipt of a suggestion for a show window display of Poultry Netting and Fencing Material which embodies unique features. The arrangement contemplates covering the floor of the window with clean sand. Rolls of Wire Netting and coils of smooth Fence Wire are arranged just inside and parallel with the glass, these extending from each end about one quarter of the length of the window. This leaves half of window front unincumbered. A keg of Netting Staples and one of Fence Staples, with the heads removed, are to be laid on their sides so that a portion of the contents will spill upon the sand. A fence is built across the length of the window, dividing its depth into two equal parts. The fence is to be exceedingly primitive in its construction, composed of sundry and miscellaneous strips of boards and wood of various kinds and sizes, the object being to make the fence as crude and unattractive as possible. On the fence are to be nailed signs of a character frequently seen along country roads, making them as pertinent and suggestive as possible. Some of these might read: "Buy your Hardware of —— ——," "Fair treatment at —— ——," "I trade at —— ——," "Don't swing on the Gate," etc. Between the fence and the back of the window are placed a hen and brood of little chickens, which are calculated to arrest the attention of passers-by. These suggestions come from Harry H. Woodward, window dresser for Franzen Bros., Riverside, Cal.

Current Hardware Prices.

REVISED AUGUST 18, 1903

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓@33⅓&10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued June, 1903, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Abrasives—

damite in Carloads:
Crystal ₱ ton $90@100
Grain ₱ ton $120@140
See also *Emery*.

Adjusters, Blind—

Domestic, ₱ doz. $3.00 33⅓%
North's 10%
Zimmerman's—See *Fasteners, Blind.*

Window Stop—

Ives' Patent 25&5%
Taplin's Perfection 25&5%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—American—

Armand Hammer, Wrought ₱ lb 8½@8¾¢
Buel Patent Trenton ₱ lb 9@9½¢
Eagle Anvils ₱ lb 7¼@7¾¢
Hay-Budden, Wrought 9@9¼¢
Horseshoe brand, Wrought 9@9¼¢

Imported—

Peter Wright & Sons ₱ lb 10¼¢

Anvil, Vise and Drill—

Millers Falls Co., $18.00 15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Hull Bros. Co.:
Lots of 1 doz. 25%
Smaller Lots 20%
Lots of 3 doz. 30%

Augers and Bits—

Com. Double Spur 70&10@75%
Boring Machine Augers 66⅔@70%
Car Bits, 12-in. twist 60@60&10%
Jennings' Pattern 50&10&5@60%
Ford's Auger and Car Bits 40%
Forstner Pat. Auger Bits 25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list 25&10%
No. 30. R. Jennings' List. 40&7½&10%
Russell Jennings' 25&10&2½%
L'Hommedieu Car Bits 15&10%
Mayhew's Countersink Bits 45%
Millers' Falls 50&10&7½%
Pugh's Black 20%
Pugh's ennings' Pattern 35%
Snell's Auger Bits 60%
Snell's Bell Hangers' Bits 50&10%
Snell's Car Bits, 12-in. twist 60%
Wright's Jennings Bits (R. Jennings' list) 50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's small, $15; large, $26 50&10%
Lavigne's Clark's Pattern, No. 1, ₱ doz., $26; No. 2, $18 50&10%
C. E. Jennings & Co., Steer's Pat. 25&10%
Swan's 60%

Gimlet Bits—

Common Double Cut..gro. $2.75@3.00
German Pattern.....gro. $4.00@4.25

Hollow Augers—

Bonney Pattern, per doz. $10.00@11.00
Ames 35&10%
New Patent 35&10%
Universal 20%
Wood's Universal 25%

Ship Augers and Bits—

Ford's 40%
Snell's 40%
C. E. Jennings & Co.:
L'Hommedieu's 15&10%
Watrous' 33⅓&10%

Awl Hafts, See *Hafts, Awl.*

Awls—

Brad Awls:
Handled.....gro. $2.75@3.00
Unhandled, Shouldered.gro.63@66c
Unhandled, Patent.....gro. 66@70c
Peg Awls:
Unhandled, Patent....gro. 31@34c
Unhandled, Shouldered.gro.63@70c
Scratch Awls:
Handled, Common..gro. $3.50@4.00
Handled, Socket..gro. $11.50@12.00
Hurwood 60%

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

First Quality, factory brands...$5.50
First Quality, jobbers' brands... $5.00@5.25
Second Quality.....$4.50@4.75

Axle Grease—See *Grease, Axle*

Axles—Iron or Steel

Concord, Loose Collar....4½@5c
Concord, Solid Collar....4¾@5½c
No. 1 Common.....3¾@4 c
No. 1 Com. New Style..3¾@4 c
No. 2. Solid Collar.....4¼@4½c
Nos. 11 to 14 ....60&10&10@70%
Nos. 15 to 18..... %
Nos. 19 to 23.....70&10&5%
} 2% cash 10 days.

Boxes, Axle—

Common and Concord, not turned.. lb. 4¼@4½c
Common and Concord, turned..... lb. 5@5½c
Half Patent.....lb. 9@9½c

Balances—Sash—

Caldwell new list 50%
Pullman's 60%

Spring—

Spring Balances..... 60@60&5%
Chatillon's:
Light Spg. Balances 40&10%
Straight Balances 40%
Circular Balances 50%
Large Dial 30%
Pelouze 50%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb., per lb.. 3@3½c

Towel—

No. 10 Ideal, Nickel Plate ₱ gro, $8.50
No. 20 Ideal, Brass Finish ₱ gro $8.50

Baskets—

Hoffman's Brick Baskets ..each $3.25

Beams, Scale—

Scale Beams, List Jan. 12, '85.40&10%
Chattillon's No. 1 30%
Chattillon's No. 2 40%

Beaters—Egg—

Lightning Chain, ₱ doz, $1.15; ₱ gro... $12.00
National Mfg. Co.: ₱ gro.
No. 1 Dover, Family size $7.00
No. 2 Dover, Hotel size 14.00
Taplin Mfg. Co.: ₱ gro.
No. 69 Improved Dover $6.50
No. 75 Improved Dover $7.50
No. 75-2 Imp'd Dover, Tin'd $9.00
No. 100 Improved Dover $8.00
No. 102 Improved Dover, Tin'd $9.50
No. 150 Improved Dover, Hotel $15.00
No. 152 Imp'd Dover, Hotel, T'd $17.00
No 200 Imp'd Dover Tumbler $9.00
No. 202 Imp'd Dover Tumbler Tin'd $10.00
No. 300, Imp'd Dover Mammoth, ₱ doz $27.00
Wonder (S. S. & Co.) ₱ gro. $6.00

Bellows—

Blacksmith, Standard List..75@75&5%

Blacksmiths'—

Inch..	*30*	*32*	*34*	*36*	*38*	*40*
Each..	*$3.50*	*3.75*	*4.25*	*4.80*	*5.35*	*6.15*

Extra Length:
Each..$4.00 4.55 5.10 5.60 6.40 7.50

Molders—

Inch.....	*10*	*12*	*14*
Doz.....	*$8.50*	*10.00*	*13.00*

Hand—

Inch.....	*6*	*7*	*8*	*9*	*10*
Doz.....	*$4.25*	*4.50*	*5.00*	*6.50*	*7.75*

Net Prices.

Bells—Cow—

Ordinary goods..... 75&5@75&10%
High grade..... 70@10@70@10@5%
Jersey 75&10%
Texas Star 50%

Door—

Abbe's Gong 45%
Barton Gong 55%
Home, R. & E. Mfg. Co.'s 55&10%
Lever and Pull, Sargent's ....60&10&10%
Yankee Gong 35%

Hand—

Hand Bells, Polished....60&5@60@1%
White Metal .....55@55&10%
Nickel Plated.....50@50&5%
Swiss .....60@60@1½%
Cone's Globe Hand Bells....33⅓@33⅓&10%
Silver Chime..... 33⅓@33⅓&10%

Miscellaneous—

Farm Bells.....lb. 2@2¼c
Steel Alloy Church and School.....60%
American Tube & Stamp'g Co. Gongs ..70%
Trip Gong Bells.....55&10@60%

Belting—Rubber—

Agricultural (Low Grade)..75@75&5%
Common Standard.....70@70&10%
Standard .....65@70%
Extra .....60@5@60&10%
High Grade..... ....50@5@50&10%
Boston Belting Co.:
Seamless Stitched Imperial..... 45&5%
Boston 50&5%
Niagara 60&5%

Leather—

Extra Heavy, Short Lap....60@60&5%
Regular Short Lap 60&10@60&10&10%
Standard .....70@70&5%
Light Standard.....70&10%
Cut Leather Lacing.....60&10%
Leather Lacing Sides, per sq. ft..18c

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender 40%
Green River Tire Benders and Upsetters 20%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.50. No. 5, $20.50.

Bicycle Goods—

John S. Leng's Son's 1902 list:
Chain 50%
Parts 50%
Spokes 50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—Tackle—

Common Wooden.....70@10@75@5% to low Steel Blocks, with Ford's Patent Sheaves 50&10%
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty, Mal. Iron.....50&10%
See also *Machines, Hoisting.*

Boards Stove—

Zinc, Crystal, &c.....30@10@40@10%

Bolts—

Carriage, Machine, &c.—

Common, list Feb. 1, '02 65&10@65&5%
Phila. Eagle, $3.00 list May 24, '99.... 80@80@5%
Bolt Ends, list Feb 14, '97. 65@65&5%
Machine, list Oct. 1, '99..... 65@65@5%
Machine with C & T. Nuts..... 60@2½@..%

Door and Shutter—

Cast Iron Barrel, Round Brass Knob:

Inch.....	*3*	*4*	*5*	*6*	*8*
Per doz...	*$0.26*	*.30*	*.39*	*.47*	*.65*

Cast Iron Spring Foot:

Inch	*6*	*8*	*10*
Per doz.....	*$1.00*	*1.25*	*1.75*

Cast Iron Chain, Flat, Japanned:

Inch.....	*6*	*8*	*10*
Per doz	*$0.75*	*1.05*	*1.30*

Cast Iron Shutter, Brass Knobs:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.57*	*.80*	*1.00*

Wrt Barrel, Jap'd. 75@10@75&10@10%
Wrought " Bronzed. 50@5@50&10%
Wrought Flush, B. K..50@10@60@10%
Wrought Shutter...40@10@10@60@5%
Wrought Square Neck.....50@50&10%
Wrought Sunk, Flush.....50@50&10%
Ives' Patent Door 60%

Stove and Plow—

Plow .....60@60@5%
Stove.....80@80@10%

Tire—

Common.....72½@72½@10%
Norway Iron.....80@80@5%
American Screw Company:
Norway Phila., list Oct. 16, '84.....80%
Eagle Phila., list Oct. 16, '84.....82½%
Bay State, list Dec. 28, '99.....72½%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84....80%
Eagle Phila., list Oct. 16, '84.....82½%
Eclipse, list Dec. 28, '99.....72½%
Russell, Burdsall & Ward Bolt & Nut Co.
Empire, list Dec. 28, '99.....72½%
Norway Phila., list Oct. '84.....80%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch.....	*1/4*	*1/2*	*1¾*	*2*
Per doz..	*$4.30*	*5.00*	*5.75*	*7.25*
Inch		*2¼*		*2½*
Per Doz.....		*$8.65*		*11.50*

Enterprise Mfg. Co., No. 1, $1.35; No. 2, $1.65; No. 3, $2.50 each 25%

Boxes, Mitre—

C. E. Jennings & Co. 25&10%
Langdon 15&10%
Shumaker 40%

Braces—

NOTE.—*Most Braces are sold at net prices.*
Common Ball, American...$1.15@1.25
Barber's 50&10&10@60&10%
Fray's Genuine Spofford s. 60%
Fray's No. 70 to 120, $1 to 123, 207 to 414 60%
C. E. Jennings & Co. 50&5&10%
Mayhew's Ratchet 60%
Mayhew's Quick Action Hay Patent..50%
Millers Falls Drill Braces 25&10%
P., S. & W. Co. Peck's Patent 60&10&65%

Brackets—

Wrought Steel .....80@80@5%
Bradley's Wire Shelf:
Full cases ...80&10&10%
Broken cases 80&10%
Griffin's Pressed Steel 80%
Griffin's Folding Brackets 70&10%

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—

Wire Goods Co. 75@75&10%

Buckets, Well and Fire—See *Pails*

Bucks Saw—

Hoosier ₱ gro. $36.00

Bull Rings—See *Rings, Bull.*

Butts—Brass—

Wrought list Sept., '96....30@30&10%
Cast Brass, Tiebout's 50%

Cast Iron—

Fast Joint, Broad.....50@50&10%
Fast Joint, Narrow.....50@50&10%
Loose Joint.....70&5@70&10%
Loose Pin.....70&5@70&10%
Mayer's Hinges.....70&5@70&10%
Parliament Butts.....70&5@70&10%

Wrought Steel—

Table and Back Flaps.....75%
Narrow and Broad.....75%
Inside Blind.....75&10%
Loose Pin.....75&10%
Loose Pin, Ball and Steeple Tip 60&10%
Japanned, Ball Tip Butts.70&10%
Bronzed Wrt. Nar. and Inside Blind Butts.....55&10%
} Extra 10@10&10%

Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series 5%
1200 series 33⅓%
200, 300, 600 and 900 series 40&10%
Hendryx Bronze:
700, 800 series 40&10%
Hendryx Enameled 40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong.....per lb. 4@4¼c
Sharp, 1 prong.....per lb. 4¼@4½c
Perkins' Blunt Toe ₱ lb 3½¢
Perkins' Sharp Toe ₱ lb 4 ¢

Cannons—

Breech Loading, 32 cal. Cartridge, Toy Cannons.....per doz. $2.00

Can Openers—See *Openers, Can*

Cans, Milk—

	5	8	10 gal.	
Illinois Pattern.	$1 50	2.00	2.25	each.
Iowa Pattern...	....	2.35	2.50	each.
	20	30	40	qts.
New York Patt'rn	1.65	2.40	2.75	each.
Baltimore Patt'rn	....	1.80	2.00	each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.
$48.00	60.00	120.00 gro

Caps—Percussion—

Elcy's E. B......60c
G. D.....*per M* $4@$5c
F. L.....*per M* 40@45c
G. E.....*per M* 50@55c
Musket.....*per M* 62@63c

Primers—

Berdan Primers, $1.00 per M.....5%
B. L Caps (Sturtevant Shells) $1.00 per M.....5%
All other primers per M. $1.22@$1.27

Cartridges—

Blank Cartridges:
22 C. F., $5.50.....10c&5%
38 C. F., $7 00.....10c&5%
22 cal. Rim, $1 50.....10c&5%
32 cal. Rim, $2.75.....10c&5%
B. B. Caps, Con., Ball Swgd.....$1 90
B. B. Caps, Round Ball.....$1.40
Central Fire.....25%
Target and Sporting Rifle.....15c&5%
Primed Shells and Bullets.....15c&10%
Rim Fire Sporting.....50%
Rim Fire, Military.....15c&5%

Cases, Show—

Sun, No. 102, Silent Salesman, 6 ft., $25.00

Casters—

Bed.....70@70c&10%
Plate.....60@60c&5%
Philadelphia.....75@75c10%
Boss.....70&10%
Boss Anti-Friction.....70&10%
Martin's Patent (Phœnix).....45%
Standard Ball Bearing.....45%
Tucker's Patent low list.....30%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Coil—

American Coil, Jobbers' Shipments:

3-16	¼	5-16	⅜	7-16	½	9-16
8.50	5.50	4.40	4.00	3.80	3.70	3.65
⅝	¾	⅞	1 to 1¼ inch.			
3.60	3.55	3.50	3.40	per 100 lb.		

German Coil.....60&10c10%

Halters and Ties—

Halter Chains.....60c10@60c10c10%
German Halter Chains, list July 24, '97.....60c10&10@70c10%
Cow Ties.....60@60c10%

Trace, Wagon, &c.—

Traces, Western Standard: 100 pair
6½—6-3, Straight, with ring...$26.00
6½—6-2, Straight, with ring...$23.50
6½—8-2, Straight, with ring...$30.00
6½—10-2, Straight, with ring...$35.00
Add 2¢ per pair for Hooks.
Twist Traces 2¢ per pair higher than Straight Link.
Trace, Wagon and Fancy Chains.....60@60c10%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron.....60c10@60c10c10%
Brass.....60c10@60c10c10%
Safety Chain.....70c10@75c&5%
Gal. Pump Chain.....*lb.* 4½@4¾c
Covert Mfg. Co.
Breast.....40&2%
Halter.....40&2%
Heel.....40&2%
Rein.....40&2%
Stallion.....40&2%
Covert Sad. Works:
Breast.....70%
Halter.....70%
Hold Back.....70%
Rein.....70%
Oneida Community:
Am. Coil and Halters.....40@45&5%
Am. Cow Ties.....45@50%
Eureka Coil and Halter.....45@50&5%
Niagara Coil and Halters.....45@50&5%
Niagara Cow Ties.....45&5@50&10&5%
Wire Dog Chains.....45@50&5%
Wire Goods Co.:
Dog Chain.....70&10%
Universal Dbl-Jointed Chain.....50%

Chalk—(From Jobbers.)

Carpenters' Blue.....*gro.* 40c
Carpenters', Red.....*gro.* 35c
Carpenters', White.....*gro.* 30c
See also Crayons.

Checks, Door—

Bardsley's.....40&10%
Columbia.....50&10%
Eclipse.....60%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools.....55%
Youths' Chests, with Tools.....40%
Gentlemens' Chests, with Tools.....30%
Farmers', Carpenters', etc, Chests, with Tools.....30%
Machinists' and Tip's Fitters' Chests, Empty.....50%
C. E. Jennings & Co.'s Machinists' Tool Chests.....33⅓&10%

Chisels—

Socket Framing and Firmer

Standard List.....70@70c10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Socket Firmer No. 18.....60&10%
C. E. Jennings & Co. Socket Framing No. 15.....60&10%
Swan's.....70%
L. & I. J. White.....30@30&5%

Tanged—

Tanged Firmers.....40c&5@40&10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Nos. 191, 181.....16⅔&10%
L. & I. J. White, Tanged.....35&5%

Cold—

Cold Chisels, good quality, lb. 13@15c
Cold Chisels, fair quality..lb. 11@12c
Cold Chisels, ordinary.....*lb. 9 @10c*

Chucks—

Beach Pat., each $8.00.....35&5%
Pratt's Positive Drive.....25%
Empire.....25%
Blacksmiths'.....25%
Skinner Patent Chucks:
Combination Lathe Chucks.....40%
Drill Chucks, Patent and Standard.....30%
Drill Chucks, New Model.....25%
Independent Lathe Chucks.....40%
Improved Planer Chucks.....25%
Universal Lathe Chucks.....40%
Face Plate Jaws.....40%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination.....40%
Case Drill.....30%
Geared Scroll.....30%
Independent.....40%
Union Drill.....30%
Universal.....40%
Face Plate Jaws.....35%
Wescott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....40%
Little Giant Double Grip Drill.....40%
Little Giant Drill, Improved.....40%
Oneida Drill.....40%
Scroll Combination Lathe.....40%

Clamps—

Adjustable, Hammers'.....20@20&5%
Cabinet, Sargent's.....50&10%
Carriage Makers', P., S. & W. Co.....50%
Carriage Makers' Sargent's.....60%
Besly, Parallel.....33⅓&10%
Lineman's, Utica Drop Forge & Tool Co.40%
Saw Clamps, see *Vises, Saw Filers'.*

Cleaners, Drain—

Iwan's Champion, Adjustable.....55%
Iwan's Champion, Stationary.....40%

Sidewalk—

Star Socket, All Steel.....₱ doz. $4.05 net
Star Shank, All Steel.....₱ doz. $3.24 net
W. & C. Shank, All steel, 7½ in. ₱ doz., $3.05; 8 in., $3.10; 8½ in., $3.25.

Cleavers, Butchers'—

Foster Bros.....30%
New Haven Edge Tool Co.'s.....45%
Fayette R. Plumb.....33⅓&33⅓&10%
P., S. & W.....50@50&5%
L. & I. J. White.....30%

Clippers—

Chicago Flexible Shaft Company:
'98 Chicago Horse.....$8.75
1902 Chicago Horse.....$10.75
Lightning Belt.....$15.00
Chicago Belt.....$20.00
Stewart's Patent Sheep.....$18.50
} 15%

Clips, Axle—

Eagle and Superior ¼ and 5-16 inch.....70c10%
Norway, ½ and 5-16 inch..70@70c10%

Cloth and Netting, Wire—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Compression and Plain Bibbs.....65c10@70%
Globe, Kerosene, Racking, &c., Cocks.....65c&5@70c&5%

Coffee Mills—See *Mills, Coffee.*

Collars, Dog—

Brass, Walter B. Stevens & Son's list.40%
Embossed, Gilt, Walter B. Stevens & Son's list.....30&10%
Leather, Walter B. Stevens & Son's list40%

Combs, Mane and Tail—

Covert's Saddlery Works.....60&10%

Compasses Dividers, &c.

Ordinary Goods.....75@75c&5%
Bemis & Call Hdw. & Tool Co.:
Dividers.....65%
Calipers, Call's Patent Inside.....55%
Calipers, Double.....65%
Calipers, Inside or Outside.....65%
Calipers, Wing.....60%
Compasses.....60%
J. Stevens A. & T. Co.....5&10%

Compressors, Corn Shock—

J. B. Hughes' ₱ doz.....$2.50

Conductor Pipe, Galva.—

L. C. L. to Dealers:

Territory.	*Nested.*	*Not nested.*
Eastern....	7c@12½%	7c@7½%
Central.....	7c@7½%	7%
Southern...	65c10%	65c&5%
S. Western..	65c@7½%	65c@7½%

Terms, 2% for cash. With delivery on full crates.
See also *Eave Troughs.*

Coolers, Water—

Gal. each.	2	3	4	6	8	
Labrador	$1.20	$1.50	$1.80	$2.10	2.70	
Gal.	3	4	6	8		
Iceland, ea.	$1.80	$2.10	$2.40	$3.00		
Gal....	2	3	4	6	8	
Galv. Lined Ea.	$1.85	$2.00	$2.25	$2.90	$3.90	25%

Galv. Lined side bandles

Gal.	2	3	4	6	8	
Each.	$1.95	$2.15	$2.40	$3.3)	$4.15	25%

Coopers' Tools—

See *Tools, Coopers'.*

Cord—Sash—

Braided, Drab.....*lb.* 27@28c
Braided, White, Com.....*lb.* 19@22c
Cable Laid Italian..lb. A, 18c; B, 16c
Common India.....*lb.* 10@10½c
Cotton Sash Cord, Twisted....16@20c
Patent Russia.....*lb.* ..@13c
Cable Laid Russia.....*lb.* ..@14c
India Hemp, Braided.....*lb* ..@18c
India Hemp, Twisted.....*lb.* 12@13c
Patent India, Twisted.....*lb.*12@13c
Anniston Cordage Co.:
Old Glory, Nos. 7 to 12.....₱ lb 24 ¢
Anniston, Nos. 7 to 12.....₱ lb 19 ¢
Old Colony, Nos. 7 to 12.....₱ lb 18½¢
Anniston Drab, Nos. to 12.....₱ lb 24 ¢
Pearl Braided, cotton, No. 6 ₱ lb, 20¢; Nos. 7 to 12, 1½¢.
Massachusetts, White.....₱ lb 22½¢
Massachusetts, Drab.....₱ lb 26½¢
Eddystone Braided Cotton.....₱ lb 19¢
Harmony Cable Laid Italian.....₱ lb 18¢
Ossawan Mills:
Crown, Solid Braided White...₱ lb 22¢
Braided, Giant, White.....₱ lb 20¢
Peerless:
Cable Laid Italian.....16¢
Cable Laid Russian.....14¢
Cable Laid India.....12¢
Braided India.....18¢
Phœnix, White.....19¢
Samson, Nos. 7 to 12:
Braided, Drab Cotton.....₱ lb 32½¢
Braided, Italian Hemp.....₱ lb 32½¢
Braided, Linen.....₱ lb 49¢
Braided, White Cotton, Spot.₱ lb 28½¢
No. 6 cords, 1¢ extra.
Silver Lake:
A quality, Drab, 40¢.....15%
A quality, White, 35¢.....15%
B quality, Drab, 35¢.....15%
B quality, White, 30¢.....15%
Italian Hemp, 40¢.....15%
Linen, 57½¢.....15%

Wire, Picture—

List Oct., '00.....85c10@85c10c&5%

Crackers, Nut—

Little Giant.....₱ gr. $24.00

Cradles—

Grain.....50%

Crayons—

White Round Crayons, gross. 5½@6c
Cases, 100 gro., $4.00, at factory.
D. M. Steward Mfg. Co.
Metal Workers' Crayons, gr. $2.50
Soapstone Pencils, round, flat or square.....gr. $1.50
Rolling Mill Crayons.....gr. $2.50
Railroad Crayons (composition) gr. $2.00
} Case lots 20%
See also *Chalk.*

Crooks, Shepherds'—

Fort Madison, Heavy.....₱ doz. $7.00
Fort Madison, Light.....₱ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden.....50%

Cutlery, Table—

International Silver Company:
No. 12 Medium Knives, 1847..₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....₱ doz. $3.00
Wm. Rogers & Son.....₱ doz. $2.5)
Simeon L. & Geo. H. Rogers Company:
12 dwt. Medium Knives.....₱ doz. $3.0)
No. 77 Medium Knives.....₱ doz. $2.5)

Cutters—Glass—

H. H. Mayhew Co.....40%
Red Devil.....50%
Smith & Hemenway Co.....50%
Woodward.....40%

Meat and Food—

Hale's.. Nos..	*111*	*112*	*113*
Per doz ..	*$8.10*	*9.90*	*13.50*

American.....30%

Nos.	1	2	3	4	5
Each.....	$5	$7	$10	$25	$50 $60

Enterprise.....25@25&7½%

Nos.	5	10	12	22	32
Each.....	$2	$3	$2.75	$4.50	$6

Dixon's, ₱ doz.....30&10&40%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Home No. 1, ₱ doz. $22.75.....50&10%
Little Giant, ₱ doz.....33⅓&5&40%

Nos.	305	310	312	340	322
	$35.00	$48.00	$44.00	$72.00	$68.00

N. E. Food Choppers.....40%
Sterling.....40@40&1 %

No 1	$2.00 each	No. 2	$2.50 each

New Triumph No. 605, ₱ doz. $24.00..
30&10@40%
Woodruff's, ₱ doz.....30&10&40%

Nos.	100	150
	$15.00	$18.00

Enterprise Beef Shavers.....25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw, Corn Grater, &c.....40%
Kraut Cutters 24 x 7, 26 x 8, 30 x 9.55%
Kraut Cutters 36 x 12, 40 x 12.....40%
Sterling $6.00 each.....33⅓%
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....40%
Slaw Cutters, 1 Knife, ₱ gr....$15@$20
Slaw Cutters, 2 Knife, ₱ gr....$22@$36

Tobacco—

All Iron, Cheap.....*dos. $4.25@$4.50*
Enterprise.....25&5%
National, ₱ doz. No. 1, $21; No. 2, $18..40%
Sargent's, ₱ doz., No. 2.....60%
Sargent's No 12 and 21.....5&10%

Washer—

Appleton's, ₱ doz. $16.00.....50&10%
Bonney's.....40%

Diggers, Post Hole, &c.—

Dalbey Post Hole Auger...per doz., $9.00
Iwan's Improved Post Hole Auger.40&5%
Iwan's Vaughan Pattern Post Hole Augers, ₱ doz.....$6.75
Iwan's Perfection Post Hole Digger, ₱ doz. $8.50
Iwan's Split Handle Post Hole Diggers, ₱ doz.....$7.50
Kohler's Universal.....₱ doz. $15.00
Kohler's Little Giant.....₱ doz. $12.6)
Kohler's Hercules.....₱ doz. $10.00
Kohler's Invincible.....₱ doz. $9 ⁶0
Kohler's Rival.....₱ doz. $8.5)
Kohler's Pioneer.....₱ doz. $7.50
Never-Break Post Hole Diggers, ₱ doz. $24.00.....60%
Samson, ₱ doz. $34.00.....25%

Dividers—See *Compasses.*

Doors, Screen—

Phillips', style E, ¾ in.....₱ doz. $10.50
Phillips', style 077, ⅞ in. .....₱ doz. $8.00
Phillips', style x-y, ⅞ in.....₱ doz. $11.00
Porter's Plain, No. 6.....₱ doz. $6 75
Porter's Ornamental, No. 70. ₱ doz. $10.50
Porter's No. 99.....$9.00
Porter's No. 44.....$10.75

Drawers, Money—

Sun Money Drawers, No. 5, ₱ doz. $
No. 6, with Bell, $10.00; No. 6, with G
$10.50.
Tucker's Pat. Alarm Till No. 1, ₱ d
$18; No. 2, $15; No. 3, $12; No. 4,

Drawing Knives—

See *Knives, Drawing.*

Drills and Drill Stocks

Common Blacksmiths' Drill...ea. $1.50@$
Breast, Millers Falls.....15
Breast, P., S. & W.....40
Goodell Automatic Drills..40&5@40&
Johns.n's Automatic Drills Nos. 2 a
3.....16⅔&
Johnson's Drill Points.....16⅔&5&
Millers Falls Automatic Drills...33⅓&
Ratchet, Curtis & Curtis.....
Ratchet, Parker's.....
Ratchet, Weston's.....
Ratchet, Whitney's, P.S. & W.....
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓

Twist Drills—

Bit Stock.....63c10@60c10c
Taper and Straight Shank.....60c10@60c10c

Drivers, Screw—

Screw Driver Bits..per doz. ..45@
Balsey's Screw Holder and Driver, ₱ doz. 2½-inch, $6; 4-in., $7.50 6-in., $9.
Buck Bros.....30%
Buck Bros' Screw Driver Bits.....30%
Champion.....50%
Edson.....60%
Fray's Hol. H'dle Sets, No. 3, $12.00 50%
Gay's Double Action Ratchet.....
Goodell's Auto 50&10c10@50&10c10&5%
Hurwood.....40%
Mayhew's Black Handle.....60%
Mayhew's Monarch.....40&10%
Millers Falls, Nos. 20 and 21.....25&10%
Millers Falls, Nos. 11, 12, 41, 42.....15&10%
Never Turn.....60%
New England Specialty Co.....50%
Sargent & Co.'s:
Nos. 1, 50, 55 and 60.....60%
Nos. 20 and 40.....70%
Smith & Hemenway Co.....40&5%
Stanley's R. & L. Co.'s:
No. 64, Varnished Handles 30@60&10& 10%
No. 85.....70@70&10&10%
Swan's:
Nos. 65 to 68.....50%
No. 40.....40&10%
Nos. 25, 35 and 45.....20&10&10%

Eave Trough, Galvanized

Territory.	*L. C. L.*
Eastern.....	75c16⅔%
Central.....	75c12½%
Southern.....	75c25%
S. Western..	75%

Terms, 2% for cash.
See also *Conductor Pipe and Elbows.*

Elbows and Shoes—

Factory shipments.....60%
Perfect Elbows (S. S. & Co.).....30%

Emery, Turkish—

	¼ to ½	5/4 to 1	50 Flour
Kegs.....	*lb.* 5c	5½c	5½c
½ *Kegs*.....	*lb.* 5¼c	5¾c	5¾c
Kegs.....	*lb* 5c	6c	
10-lb cans. 10 in case	6½@	7c	6c
10-lb. cans, less than 10	10c	10c	8c

NOTE.—*In lots 1 to 3 tons a discount of 10% is given.*

Extractors, Lemon Juice—See *Squeezers, Lemon.*

Fasteners, Blind—

Zimmerman's.....50&10%
Walling's.....50%

Cord and Weight—

Ives.....40%

Faucets—

Cork Lined.....50@50&10%
Metallic Key, Leather Lined.70@70&10%
Red Cedar.....40@40&10%
Petro'eum.....70c10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star.....60%
West Lock.....50&10%
John Sommer's Peerless Tin Key.....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Metal Key.50&10%
John Sommer's Duplex Metal Key.....60%
John Sommer's Diamond Lock.....40%
John Sommer's I. X. L. Cork Lined.....50%
John Sommer's Reliable Cork Lined 50&10%
John Sommer's Chicago Cork Lined.....60%
John Sommer's O. K. Cork Lined.....50%
John Sommer's No Brand, Cedar.....50%
John Sommer's Perfection Cedar.....40%
McKenna, Brass:
Burglar Proof, N. P.....35%
Improved, ¼ and ⅜ inch.....35%
Self Measuring:
Enterprise, ₱ doz. $30.00.....40&10%
Lane's, ₱ doz. $36.00.....40&10%
National Measuring, ₱ doz. $36..40&1 %

Felloe Plates—

See *Plates, Felloe.*

Files—Domestic—

List revised Nov. 1, 1899.
Best Brands.....70c5@70c10c&5%
Standard Brands. 75c5@75c10c&10%
Second Quality.....75c10c10@80c&5%

Imported—

Stubs' Tapers, Stubs' list, July 24, '97.....35%

Fixtures, Grindstone—

Net Prices:

Inch....	*15*	*17*	*19*	*21*	
Per doz.	*$2.85*	*3.00*	*3.50*	*4.00*	5

P., S. & W. Co.....30&10c&
Reading Hardware Co.....60
Sargent's.....60&10&1
Stowell's Giant Grindstone Hanger.....
₱ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy.....50&10&1
Stowell's Grindstone Fixtures Light.....60&1

Fodder Squeezers—

See *Compressors.*

Forks—*Aug. 1, 1899, list.*
Hay, 3 tine 60%
Hay, 3 tine ..... 60&7½%
Hay, 4 tine 66⅔%
Hay, Header and Baler 3 tine 60&15%
Hay, Header and Baler, 4 tine 66⅔%
Grain or Barley 70%
Manure, 4 tine ..... 60&20%
Manure, 5 and 6 tine ..... 60&20%
Spading ..... 70&5%
Extra 10%

Iowa Dig-Eay Potato 65%
Victor, Hay 66⅔%
Victor, Manure 66⅔%
Victor, Header 66⅔%
Champion, Hay 66⅔%
Champion, Manure ..... 60&20%
Columbia, Hay ..... 66⅔&5%
Columbia, Manure 70%
Columbia, Spading ..... 70&10%
Hawkeye Wood Barley 4 tine ₱ doz. $5.00; 6 tine, $6.00.
W. & C. Potato Digger 65%
Acme Hay ..... 60&10&7½%
Acme Manure, 4 tine ..... 60&20&10%
Acme Manure, 6 tine ..... 66⅔&10&2%
Dakota Header ..... 65&15&5%
Jackson Steel Barley ..... 65&15&5%
Kansas Header 66⅔%
W. & C. Favorite Wood Barley 4 tine, ₱ doz., $5.00; 6 tine, $6.00
Plated.—See *Spoons.*

Fountains, Stock—
Double Dewey ..... ₱ doz. $26.00 ..... 50%

Frames— Saw—
White, Straight Bar, per doz. 75@80c
Red, Straight Bar, per doz $1.00@$1.25
Red, Double Brace, per doz. $1.40@1.50

Freezers Ice Cream—

Qts...	*2*	*3*	*4*	*6*	*8*	*10*
Best..	$1.45	1.65	1.95	2.40	3.20	4.00
Good	$1.25	1.40	1.60	2.00	2.70	3.60
Fair..	$1.00	1.10	1.30	1.75	2.30	2.90

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp Fuse $3.60
Cotton Fuse 3.90
Single Taped Fuse 3.25
Double Taped Fuse 4.20
Triple Taped Fuse 5.00
10&2½%

Gates, Molasses and Oil—

Stebbins' Pattern ..... 80@80&10%

Gauges—
Marking, Mortise, &c. ..... 50&10@50&10&10%
Chapin-Stephens Co.:
Marking, Mortise, etc. 50&10@50&10&10%
Scholl's Patent ..... 50&10@50&10&10%
Door Hangers ..... 5&6@50&10%
Fulton's Butt Gauge ..... 30&10%
Stanley R. & L. Co.'s Butt & Babbet Gauge ..... 20@20&10&10%
Wire, Brown & Sharpe's 25%
Wire, Morse's 25%
Wire P., S. & W. Co ..... 30&10%

Gimlets— Single Cut—
Nail, Metal, Assorted, gro. $1.40@1.50
Spike, Metal, Assorted gro. $2.80@3.50
Nail, Wood Handled, Assorted, gro. $1.75@2.00
Spike, Wood Handled, Assorted gro. $3.25@3.50

Glass, American Window
Jobbers' List, Dec. 16, 1902.
Single and Double:
From store, First Three Brackets .. 90&5%
From store, all sizes above .... 90&5&5%

Glasses, Level—
Chapin-Stephens Co ..... 60@60&10&10&10%

Glue—Liquid, Fish—
Bottles or Cans, with Brush ... 25@50%
Cans (½ pts., pts., qts., ½ gal., gal.) ..... 35@48%
International Glue Co. (Martin's) ..... 40&10&50%

Grease, Axle—
Common Grade ..... *gro. $4.50@5.50*
Dixon's Everlasting ..... 10-₱ pails, ea. 85¢
Dixon's Everlasting, in bxs.. ₱ doz. 1 ₱ $1.20; 2 ₱ $2.00

Griddles, Soapstone—
Pike Mfg. Co ..... 33⅓&33⅓&10%

Grindstones—
Bicycle Emery Grinder $6.50
Bicycle Grindstones, each ..... $2.50@3.00
Pike Mfg. Co:
Improved Family Grindstones, per inch, per doz $2.00
Pike Mower Knife and Tool Grinder, each $6.00
33⅓%
Velox Ball Bearing, mounted, Angle Iron Frames ..... each, $3.25

Guards, Snow—
Cleveland Wire Spring Co.:
Galv. Steel ₱ 1000 ..... $9.00
Copper ₱ 1000 ..... $18.00

Halters and Ties—

Covert Mfg. Co.:
Web ..... 45&2%
Jute Rope ..... 40&5&2%
Sisal Rope ..... 20&2%
Covert's Saddlery Works:
Web and Leather Halters 70%
Jute and Manila Rope Halters 70%
Sisal Rope Halters ..... 60&20%
Jute, Manila and Cotton Rope Ties .. 70%
Sisal Rope Ties ..... 60&10%

Hammers—

Handled Hammers—
Keller's Machinists' .. 40&10@40&10&10%
Keller's Farriers ..... 40&10@40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75 ..... 40@40&10&10%
Peck, Stow & Wilcox 50%
Perfection R. Plumb:
Plumb, A. E. Nail .. 33⅓&7½@33⅓&10&7½%
Engineers' and B. S. Hand ..... 50&7½&5@50&10&7½&5%
Machinists' Hammers 50&5@50&10&5%
Riveting and Tinners' ..... 40&2½@40&10&2½%
Sargent's C. S. New List 40%

Heavy Hammers and Sledges—
3 lb. and under...lb 45c
3 to 5 lb ..... lb. 36c } 75@5@5,75
Over 5 lb ..... lb. 30c } &10&5%
Wilkinson's Smiths' ..... 9½@10c lb.

Handles—

Agricultural Tool Handles—
Axe, Pick, &c ..... 45@50&5%
Hoe, Rake, &c ..... 60@60&5%
Fork, Shovel, Spade, &c.:
Long Handles 60%
D Handles 50%

Cross-Cut Saw Handles—
Atkins' ..... 40&5%
Champion ..... 45@45&10%
Disston's 50%

Mechanics' Tool Handles—
Auger, assorted ..... gro. $2.50@$2.75
Brad Awl ..... gro. $1.65@$1.75
Chisel Handles:
Apple Tanged Firmer, gro. ass'd, $2.00@$2.75; large, $2.25@$3.50
Hickory Tanged Firmer, gro. ass'd $2.50@$2.75; large, $3.15@$3.25
Apple Socket Firmer, gro. ass'd, $2.25@$2.50; large, $3.00@$3.25
Hickory Socket Firmer, gro. ass'd. $2.00@$2.25; large, $2.25@$2.50
Hickory Socket Framing, gro. ass'd. $3.0@$3.25; large, $3.25@$3.50
File, assorted ..... gro. $1.25@$1.35
Hammer, Hatchet, Axe, &c 5%
Hand Saw, Varnished, doz. 60@70c
Not Varnished ..... 55@60c
Plane Handles:
Jack, doz. 25c; Jack Bolted .. 55@60c
Fore, doz. 35@38c; Fore, Bolted .. 70@75c
Chapin-Stephens Co.:
Carving Tool ..... 40@40&10%
Chisel ..... 65@65&10%
File and Awl ..... 65@65&10%
Saw and Plane ..... 40@40&10%
Screw Driver ..... 40@40&10%
Millers Falls Adj. and Ratchet Auger Handles ..... 15&10%
Nicholson Simplicity File Handle, ₱ gro ..... $0.85@$1.50

Hangers—
Barn Door, New Pattern, Round Groove, Regular:

Inch	*3*	*4*	*5*	*6*	*8*
Single Doz.	$0.85	1.20	1.50	1.90	2.30

Barn Door, New England Pattern, Check Back, Regular:

Inch	*3*	*4*	*5*	*6*
Single Doz.	$1.10	1.60	2.15	2.70

Alith Mfg. Co.
Reliable ..... per doz. $15.00
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin 25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 40%
Railroad 55%
Cronk & Carrier Mfg. Co.:
Loose Axle 60%
Roller Bearing ..... 60&10%
Lane Bros. Co.:
Parlor, Ball Bearing $4.15
Parlor, Standard $3.35
Parlor, New Model $2.85
Parlor New Champion $2.25
Barn Door, Standard. 50&10&10&5%
Covered ..... 50&10&10%
Special ..... 50&10&10&5%
Lawrence Bros.:
Advance 50%
Cleveland ..... 60&10%
Crown 60%
Giant ..... 50&10%
New York 60%
Peerless ..... 60&10%
Sterling 60%
Swing, No. 95 ..... 50&10%
Union, No. 44, $5.00; No. 45 $7.00; No. 46, $9.00.
McKinney Mfg. Co.:
No. 1, Special, $15 ..... 60&10%
No. 2, Standard, $18 ..... 60&10%
Hinged Hangers, $16 ..... 50%
Meyers' Stayon Hangers 50&10% (net)
C. S. Smith Mfg. Co.:
Lundy Parlor Door ..... 50&10%
Monarch Barn Door ..... 50&10%
Never Jump Hinge ..... 50&10%
Peerless ..... 60&10%
Perfection ..... 70&5%
Phœnix ..... 70&5%
Wagner's Adjustable ..... 70&10%
Warehouse Anti-Friction 60%
Richards Mfg. Co.:
Pioneer Wood Track No. 3 ..... $2.25
Imp'd Wood Track No. 5 ..... $2.25
Imp'd Steel Track No. 7 ..... $2.70
Imp'd Steel Track No. 7 ..... $2.65
Ball B'r'g Steel Track No. 9 ..... $2.50
Ball B'r'g Steel Track No. 10 ..... $2.50
Roller B'r'g Steel Track No. 11 .. $2.45
Roller B'r'g Steel Track No. 12 .. $2.40
Ball B'r'g Steel Track No. 13.. $2.75
Roller B'r'g Steel Track No. 14. $2.65
Ball B'r'g Trolley Track No. 15 .. 40%
Ball Brg Trolley Track No. 19.. 40&5%
Ball Bearing Tandem Trolley Track No. 16 ..... 40%
Silent Adjustable Track No. 18.. 40%
Auto Adjustable Track No. 22.. 40%
Trolley B. D. No. 17 ..... $1.60
Trolley F. D. No. 120 ..... $2.70
Trolley F. D. No. 121 ..... $2.85
Trolley F. D. No. 151 ..... $3.00
Roller Bearing D. D. No. 25.. 70&5
Roller Bearing U. S. B. D..... 70&5%
Anti Friction B. D. ..... 60&10%
Ives' Wood Track No. 1 ..... $2.15
Ives' Imp'd Wood Track No. 2.. $2.15
Stowell Mfg. and Foundry Co.
Acme Parlor Ball Bearing 40%
Atlas 60%
Badger Barn Door 50%
Baggage Car Door 50%
Climax Anti-Friction 50%
Elevator 40%
Express 30%
Interstate 60%
Lundy Parlor Door 50%
Magic 50%
Matchless 60%
Nansen ..... 60&10%
Railroad 50%
Street Car Door 50%
Steel, Nos. 300, 404, 500 ..... 40&15%
Stowell Parlor Door 50%
Wild West, Nos. 300, 400, 500 ..... 50%
Zenith for Wood Track 50%
A. L. Swett Iron Works:
Eagle ..... 60&10%
Hylo ..... 50&10%
Perfection 60%
Pilot 60%
Taylor & Boggis Fy Co. 50&15&10&5%
Wilcox Mfg. Co.:
Bike Roller Bearing ..... 60&10%
C. J. Roller Bearing ..... 60&10%
Cycle Ball Bearing 50%
Dwarf Ball Bearing 40%
Ives, Wood Track ..... 60&10%
L. T. Roller Bearing ..... 60&10&5%
New Era Roller Bearing ..... 50&10%
O. K. Roller Bearing ..... 60&10&5%
Prindle, Wood Track 60%
Richards' Wood Track 60%
Richards' Steel Track ..... 50&10%
Spencer Roller Bearing ..... 60&10%
Tandem Nos. 1 and 2 ..... 60%
Underwriters' Roller Bearing ... 40%
Velvet 50%
Wilcox Auditorium Ball Bearing. 20%
Wilcox Barn Trolley No. 123 ..... 40%
Wilcox Elv. Door, Nos 112 and 122½ 50%
Wilcox Elv. Door, No. 132 ..... 40%
Wilcox Fire Trolley, Roller Bearing 30%
Wilcox Le Roy Noiseless Ball Bearing 40%
Wilcox New Century ..... 50&10&10%
Wilcox O. K. Steel Track 50%
Wilcox O. K. Trolley 50%
Wilcox Trolley Ball Bearing 40%
Wilcox Wideman Narrow Gauge Ball Bearing 40%
Extra 50@10% often given.
For Track, see *Rail.*

Hangers, Gate—
Myers' Patent Gate Hangers, ₱ doz., net, $4.50

Hasps—
McKinney's Perfect Hasp, ₱ doz 50%

Hatchets—
Best Brands ..... 50@50&10%
Cheaper Brands ..... 60@60&10%
Note.—Net prices often made.

Hinges—

Blind and Shutter Hinges—
Surface Gravity Locking Blind: (Victor; National; 1888 O. P. Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*3*	*5*
Doz. pair	$0.85	1.75	3.50

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	$0.70	.65	.60	.55

Mortise Reversible Shutter, (Buffalo, &c.)

No.	*1*	*1½*	*2*
Doz. pair	$0.75	.70	.65

North's Automatic Blind Fixtures, No. 2, for Wood, $0.00; No. 3, for Brick, $11.50 ..... 10%
Parker ..... 70&75%
Reading's Gravity ..... 75&10%
Sargent's, Nos. 1, 3, 5, 11 & 13 ..... 70&10@70&20%
Stanley's Steel Gravity Blind Hinges, ₱ doz. sets, without screws, $0.80; with screws, $1.15.
Wrightsville H'dware Co.:
O. S., Lull & Porter ..... 7 &5%
Acme, Lull & Porter 15%
Queen City Reversible 75%
Stenger's Positive Locking, Nos. 1 & 3 ..... 70&10%
Shepard's Noiseless, Nos. 60, 65, 55 ... 70&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5 ..... 75%
1888, Old Pat'n, Nos. 1, 3 & 5 ..... 75%
Tip Pat'n, Nos. 1, 3& 5 ..... 75%
Buffalo Gravity Locking, Nos. 1, 3 & 5 ..... 75%
Shepard's Double Locking, Nos. 30 & 25 ..... 70%
Champion Gravity Locking, No. 75.. 75%
Steamboat Gravity Locking, No. 10. 75%
Pioneer, Nos. 060, 45 & 5½ 75%
Empire, Nos. 101 & 103 ..... 70%
W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 60%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with Latches	$2.00	2.70	5.00
Hinges only	$1.40	2.05	3.80
Latches only	.70	.70	.35

New England:
With Latch ..... doz ..... @$2.50
Without Latch ..... doz. ..... @$1.80
Reversible Self-Closing:
With Latch ..... doz. ..... @$1.80
Without Latch ..... doz. ..... @$1.45
Western:
With Latch ..... doz. $1.80
Without Latch ..... doz. $1.20
Wrightsville H'dware Co.:
Shepard's or Clark's, doz. sets,

No.	1	2	3
Hinges with Latches	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	1.35

Spring Hinges—
Holdback, Cast Iron ..... gro. $9.00
Non-Holdback, Cast Iron ... gro. $8.00
J. Bardsley
Bardsley's Patent Checking 15%
Bommer Bros.:
Bommer Ball Bring Floor Hinges 40%
Bommer Spring Hinges 40%
Chicago Spring Butt Co.:
Chicago Spring Hinges 25%
Triple End Spring Hinges 50%
Chicago (Ball Bearing) Floor Hinge 45%
Garden City Engine House 25%
Keene's Saloon Door 25%
Columbian Hdw. Co.:
Acme, Wrt. Steel 30%
Acme, Brass ..... 20&5%
American 30%
Columbia, No. 14 ..... ₱ gr. $9.00
Columbia, No. 18 ..... ₱ gr. $25.00
Columbia, Adjustable, No. 7, ₱ gr. $12.00
Gem, new list 30%
Clover Leaf ..... ₱ gr. $12.50
Oxford, new list 30%
Hoffman Hinge & Foundry Co.:
No. 70 & 80 Holdback Detachable 50.50
Lawson Mfg. Co.:
Machines 35%
Matchless Pivot 45%
Shelby Spring Hinge Co.:
Crown Jamb Hinge 40%
Chief Ball Bearing Floor Hinge. 45%
Royal Ball Bearing Floor Hinge.. 45%
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ₱ gr $12.50
Ideal, No. 4 ..... ₱ gr. $9.00
New Idea No. 1 ..... ₱ gr. $9.00
New Idea, Double Acting 45%
Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—
Strap and T Hinges, &c., list Mar. 15, 1901:
Light Strap Hinges ..... 80&c ¾
Heavy Strap Hinges 80&20&10%
Light T Hinges ..... 75&10&5%
Heavy T Hinges ..... 75&5%
Extra Heavy T Hinges .. 80&20%
Hinge Hasps 70%
Cor. Heavy Strap .... 80&20&10%
Cor. Ex. Heavy T ..... 80&20
Ex 10@10&10%

Screw Hook and Strap:
6 to 12 in ..... lb. 3½c
14 to 20 in ..... lb. 3¼c
22 to 36 in ..... lb. 3 c

Screw Hook and Eye:
¾ to 1 inch ..... lb. 6 c
⅝-inch ..... lb. 7 c
½-inch ..... lb. 9 c

Miscellaneous—
Hoffman's Steel Spring Butt Hinges ..... 40&10%
Hoffman's Offset Refrigerator Hinges .. 40&10%

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers. 35%

Hods, Coal—

	15	*16*	*17*	*18 inch.*
Galv. Open	$2.50	2.75	3.00	3.25 ₱ doz.
Jap. Open	$2.00	2.25	2.50	2.75 ₱ doz.
Galv. Funnel	$3.00	3.25	3.50	3.75 ₱ doz.
Jap. Funnel	$2.50	2.75	3.00	3.25 ₱ doz.

Masons, Etc.—
Cleveland Wire Spring Co.:
Steel Mortar ..... each $1.45
Steel Brick ..... each $1.10
Hoffman's:
Brick ..... each $1.10
Masons' ..... each $2.00
Plasterers' ..... each $3.20

Hoes— Eye—
Scovil and Oval Pattern ..... 60&c10@60&c10&10%
Grub, list Feb. 23, 1899 ..... 60&c10@60&c10&5%

Handled—
Aug. 1, 1899, List:
Garden ..... 70&c10%
Meadow & Rhode Island 75&c2½%
Southern Meadow ... 75&c5&2½%
Mortar and Street ..... 75&c2½%
Planters', Regular Pat'n. 70&c30%
Cotton ..... 75&c2½%
Toy, Ladies', Boys', Onion, Turnip, Berry or Tobacco. 70&c10&5%
Extra 20%

Note.—Manufacturers and jobbers use a diversity of lists, and often sell at net prices.
Ft. Madison Cotton Hoe ..... 75&7½%
Ft. Madison Crescent Cultivator Hoe, per doz ..... 75&10%
Ft. Madison Mattock Hoes:
Regular Weight ..... ₱ doz. $5.00
Junior Size ..... ₱ doz. $4.00
Ft. Madison Sprouting Hoe. ₱ doz. $4.60
Ft. Madison Dixie Tobacco Hoe.. 75&20%
Kretsinger's Cut Easy ..... 70&10%
Warren Hoe 60%
W. & C. Ivanhoe ..... 75&2%
B. B. Cultivator Hoe ..... 75&10&2%
Acme Weeding ..... 75&10&2%
W. & C. Lightning Shuffle Hoe, ₱ doz. $4.85

Hoisting Apparatus—
See *Machines, Hoisting.*

Holders— Bit—
Angular, ₱ doz. $24.00 ..... 45&10%

Door—
Empire 50%

File and Tool—
Nicholson File Holders and File Handles 33⅓%

Hooks— Cast Iron—
Bird Cage, Reading 60%
Bird Cage, Sargent's List 60%
Ceiling, Sargent's List ..... 40&10%
Clothes Line, Hoffman's ..... 40&10%
Clothes Line, Reading List 65&10@65&10&10%
Clothes Line, Sargent's List. 50&20&10%
Coat and Hat, Sargent's List ..... 45&10%
Clothes Line, Stowell's 70%
Coat and Hat, Stowell's 70%
Coat and Hat, Reading ..... 70@75%
Coat and Hat, Wrightsville 65%
Harness, Hoffman ..... per doz. 35&40%
Harness, Reading List ..... 70&10@75%

Wire—
Belt ..... 80@80&5%
Wire C. & H. Hooks ..... 70@70&5%
Atlas, Coat and Hat:
Single Cases 50%
10 Case Lots ..... 50&10%
Czar Harness ..... 50&10&5%

Wire Coat and Hat:
Acme 60%
B. B. 60%
V Brace, Chief and Czar 60%
Gem 60%
Bright Wire Goods—See *Wire.*

Wrought Iron—

Box, 6 in., per doz. $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton ..... doz. $1.05@1.25
Wrought Staples, Hooks, &c.—
See *Wrought Goods.*

Miscellaneous—

Bush, Light, doz. $5.50; Medium, $6.00; Heavy, $6.50
Grass ..... Nos. 1 2 3 4
Best $1.50 1.75 2.00
Common $1.30 1.50 1.60
Potato and Manure ..... 60%@20%
Whiffletree ..... lb. 5½@6c
Hooks and Eyes:
Brass ..... 60@10&10@10@70%
Malleable Iron ..... 70@5@70@10%
Covert Saddlery Works' Self Locking Gate and Door Hook 60%
Ft. Madison Cut-Easy Corn Hooks, ₱ doz. $5.35 net
Crown Picture ..... 50&10%
Bench Hooks—See *Bench Stops.*
Corn Hooks—See *Knives, Corn.*

Horse Nails—See *Nails, Horse*

Horseshoes—

See *Shoes, Horse.*

Hose Rubber—

Garden Hose, ¾-inch:
Competition ..... ft. 4½@ 5 c
3-ply Standard ..... ft. 6½@ 7 c
4-ply Standard ..... ft. 7½@ 8 c
3-ply extra ..... ft. 8½@ 9 c
4-ply extra ..... ft 10 @10½c
Cotton Garden, ¾-in., coupled:
Low Grade ..... ft. 6 @7 c
Fair quality ..... ft. 8 @9 c

Irons— Sad—

From 4 to 10 ..... lb 3@3½c
B. B. Sad Irons ..... lb. 3@3½c
Chinese Laundry ..... lb. 4½@5c
Chinese Sad ..... lb. 3½@4c
Mrs. Potts', per set:
Nos. 50 55 60 65
Jap'd Tops 74c 71c 81c 81c
Tin'd Tops 77c 74c 87c 84c
New England Pressing, lb. 3½@3½c

Pinking—

Pinking Irons ..... doz. 50@60c

Soldering—

Soldering Coppers 1½ and 3 .. 22@23
1 and 2 ..... 24@25c
Covert Mfg. Co ..... 20&2%

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw ..... 30&5%
Steel ..... 45&2%
Covert's Saddlery Works':
Daisy ..... 60&10%
Victor ..... 60&10%
Lockport 50%
Lane's Steel ..... 30&10%

Kettles—

Brass, Spun, Plain ..... 20@25%
Enameled and Cast Iron—See *Ware, Hollow.*

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c 30%
Hartzell Cutlery Co 50%
Smith & Hemenway Co ..... 40&10%
Hay and Straw—See *Hay Knives.*

Corn—

Withington Acme, ₱ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List ..... 70&5@70&10%
Bradley's 40%
C. E. Jennings & Co Nos. 45, 46, 60&10%
Jennings & Griffin, Nos. 5 to 1, 52, 60&10&10%
Swan's ..... 70&10&2½%
Watrous ..... 16⅔&10%
L. & I. J. White ..... 20&5@25%

Hay and Straw—

Lightning ..... ₱ doz. $6.50@7.00
Iwan's Sickle Edge ..... ₱ doz. $10.00
Iwan's Serrated ..... ₱ doz. $10.00
Maine ..... ₱ doz. $8.50

Mincing—

Buffalo ..... ₱ gro. $13.00

Miscellaneous—

Farriers' ..... doz. $2.00@3.00
Wostenholm's ..... ₱ doz. $3.00 & $3.25

Knobs—

Base, 2¼-inch, Birch, or Maple, Rubber tip, gro ..... $1.05@1.10
Carriage, Jap, all sizes .. gro. 25@30c
Door, Mineral ..... doz. 65@70c
Door, Por. Jap'd ..... doz. 70@75c
Door, Por. Nickel .... doz. $2.05@2.15
Bardsley's Wood Door, Shutter, &c .. 15%
Picture, Sargent's ..... 60&10%

Lacing Leather—

See *Belting Leather—*

Ladders, Step, Etc.—

Lane's Store 25%
Myers Noiseless Store Ladders 50%

Ladles— Melting—

L. & G. Mfg. Co 25%
P. S. & W 50%
Reading 60%
Sargent's ..... 45&10%

Lanterns— Tubular—

Regular Tubular No. 0. doz. $4.35@4.75
Lift Tubular .. No. 0 .. doz. $4.75@5.25
Hinge Tubular. No. 0, .doz. $4.75@5.25
Other Styles ..... 10@10@40@10@5%

Bull's Eye Police—

No. 1 2¾ inch ..... $2.50@2.75
No. 2, 3 inch ..... $2.75@3.00

Latches— Gate—

Hoffman's Safety Gate ..... ₱ doz. 60c

Thumb—

Roggin's Latches, with screw .. doz 35@40c

Leaders, Cattle—

Small ..... doz. 55c; large, 60c
Covert Mfg. Co ..... 45&2%

Lifters, Transom—

R & E 33⅓%

Lines—

Wire Clothes, Nos... 18 19 20
100 feet $2.20 2.00 1.65
75 feet $1.80 1.70 1.30
Ossawan Mills.
Crown Solid Braided Chalk 33⅓%
Mason's, No. 0 to No. 5 ..... 33⅓%
Samson Cordage Works:
Solid Braided Chalk, No. 0 to 3 ..... 40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₱ gr 30%
Anniston Waterproof Clothes, 50 ft., ₱ gro.: $24.00; Gilt Edge, $22.00; Air Line, $23.00; Acme, $17.00; Alabama, $16.00; Empire, $17.00. Advance, $14.00; Alliston, $13.00; Calhoun, $11.00; Oriole, $20.00; Albermarle, $13.50; Eclipse, $12.50; Chicago, $11.00; Standard, $10.00; Columbia, $9.00.

Locks— Cabinet—

Cabinet Locks ..... 33⅓@33⅓&7½%

Door Locks, Latches, &c.—

[Net prices are very often made on these goods.]
Reading Hardware Co 50%
R. & E. Mfg. Co 40%
Sargent & Co ..... 40@40&10%

Elevator—

Stowell's 40%

Padlocks—

Wrought Iron ..... 7@10@55@80@5%
R. & E. Mfg. Co. Wrt Steel and Brass, 75@75&10%

Sash, &c.—

Ives' Patent,
Bronze and Brass ..... 55&7½%
Crescent 50%
Ir n ..... 60&2½%
Wrought Bronze and Brass ..... 50&5%
Wrought Steel 55%
Reading ..... 60&10&10@70%

Machines— Boring—

Com., Upright, Without Augers .. $2.00
Com., Angular, Without Augers .. $2.25
Without Augers.
R. & E. Mfg. Co.: Upright. Angular.
Improved No. 3. $4.25 No. 1 $5.00
Improved No. 4. 3.75 No. 2 3.38
Improved No. 5. 2.75
Jennings'.. No. 4, 3.15 No. 1, 3.50
Millers' Falls 5.75
Snell's, Rice's Pat. 2.50 2.75

Hoisting—

Moore's Anti-Friction Differential Pulley Block 30%
Moore's Hand Hoist, with Lock Brake. 20%
Moore's Portable Pneumatic Hoist 25%

Ice Cutting—

Chandler's ..... 15&10%

Washing—

Boss Washing Machine Co.: Per doz.
Boss No. 1; Boss Rotary $57.00
Boss No. 7; Dietz Rotary 60.00
Champion Rotary; Banner No. 1.. 54.00
Standard Champion No. 1 ..... $48.00
Standard Perfection $36.00
Cinti quare Western $30.00
Uneeda American, Round $29.00

Mallets—

Hickory ..... 45&5@50%
Lignumvitæ ..... 45@5@50%
Tinners', Hickory and Applewood, doz ..... 50@55c

Mats— Door—

Elastic Steel (W. G. Co.) 10%

Mattocks—

See *Picks and Mattocks.*

Menders, Hose

Robinson's Hose Menders ..... ₱ gro, $2.00

Milk Cans—See *Cans, Milk*

Mills— Coffee, etc.—

Enterprise Mfg. Co ..... 25@30%
Hoffman's Side, Coffee and Spice .... ₱ doz. $1.25
National, list Jan. 1, '94 ..... 30%
Parker's Columbia & Victoria, 50&10@60%
Parker's Box and Side ..... 50&10@60%
Sun, No. 108, 1 lb mill ..... ₱ doz, $3.00
Swift, Lane Bros Co 30%

Mowers, Lawn—

Net prices are generally quoted.
Cheap ..... all sizes, $1.90@1.95
Good ..... all sizes, $2.25@2.50

	10	12	14	16-inch
High Grade	4.25	4.50	4.75	5.00
Continental				60&5%
Great American				70%
Great American Ball Bearing, new list				70%
Quaker City				70%
Pennsylvania				40&5%
Pennsylvania, Jr., Ball Bearing				60%
Pennsylvania Golf				50%
Pennsylvania Horse				40%
Pennsylvania Pony				45%
Philadelphia:				
Sty'es M., S. C., K., T				70&10%
Style A, all Steel				65&10%
Style E, High Wheel				70&10&5%
Drexel and Gold Coin, low list				50&5%

Nails—

Cut and Wire. See Trade Report.
Wire Nails and Brads, Papered. List July 20, 1899 .. 85@85&10%
Hungarian, Finishing, Upholsterers', &c. See Tacks.

Horse—

Nos.	6	7	8	9	10	
A. C	25c	23c	22c	21c	21c	40&5%
Ausable	28c	23c	25c	24c	23c	50&10%
C. B. K	25c	25c	22c	21c	21c	40%
Champ'n	28c	26c	25c	24c	23c	40&10&5%
Clinton	19c	17c	16c	15c	14c	30&10&5%
Maud S.	25c	28c	22c	21c	21c	50%
Putnam	23c	21c	20c	19c	18c	33⅓%

Putnam
Cold Rol'd 19c 18c 17c 16c .. 10&10%
American, Nos. 5 to 10 ₱ lb .. 9@9½c
Neponset ..... Nos. 5 to 10c ₱ lb 12c
Jobbers' special brands .. per lb. 8@9c

Picture—

	1½	2	2½	3	3½ in.
Brass Head	.55	.60	.70	.95	1.00 gro.
Por. Head	..	1.10	1.10	1.10	.. gro.

Crown Picture Nails ..... ₱ gro. $1.50

Nippers, See *Pliers and Nippers.*

Nuts—

Cold Punched: Off list.
Mfrs. or U. S. Standard.
Square, plain $4.50
Hexagon, plain $4.60
Square, C. T. & R $4.70
Hexagon, C. T. & R $5.00
Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd.
Square Blank ..... $4.80@5.00
Hexagon Blank ..... $5.00@5.50
Square Tapped ..... $4.60@4.80
Hexagon Tapped ..... $4.80@5.10

Oakum—

Best or Government ..... lb. 6¼c
Navy ..... lb. 4½c
U. S. Navy ..... lb. 5½c
Plumbers' Spun Oakum 2¾c
In carload lots ¼c lb. off f. o. b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—

Brass and Copper ..... 65@65&10%
Tin or Steel ..... 70@10@75%
Zinc ..... 75@75&10%
Chas. or Paragon:
Brass and Copper ..... 45&10@50%
Tin or Steel ..... 75@75&10%
Zinc ..... 60@60&10%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4; No. 3, $4.40 ₱ doz. 20%
Malleable, Hammers' Old Pattern, same list ..... 50&10%
American Tube & Stamping Co.:
Spring Bottom Cans ..... 70@70&10%
Railroad Oilers etc ..... 60@60&10%

Openers— Can—

French ..... doz. 25c
Iron Handle ..... doz. 25@27c
Sprague, Iron Hdle .. per doz 35@40c
Sardine Scissors .. doz. $1.75@$3.00
Marvel ..... per doz. $1.25
National 50%
Stowell's ..... per doz. 35@45c
Tip Top ..... per doz. $0.75

Egg—

Nickel Plate ..... per doz., $2.25
Silver Plate ..... per doz., $3.50

Packing—

Asbestos Packing, Wick and Rope, 15@15½c lb.

Rubber—

Sheet, C. I ..... 8@12c
Sheet, C. O. S ..... 9@13c
Sheet, C. B. S ..... 10@14c
Sheet, Pure Gum ..... 50@70c
Sheet, Red ..... 35@40c
Jenkins' Standard, ₱ lb 80c .. 25@25&5%

Miscellaneous—

American Packing ..... 7@10c lb.
Cotton Packing ..... 14@16c lb.
Italian Packing ..... 9@12½c lb.
Jute ..... 4c lb.
Russia Packing ..... 7@11c lb.

Pails— Creamery

S. & S. & Co., with gauges .. No 1 $6.25; No. 2, $5.50 ₱ doz.

Galvanized—

Price per doz.

Quart	10	12	14
Water, Regular	1.50	1.75	2.00
Water, Heavy	2.75	3.00	3.25
Fire, Rd. Bottom	2.30	2.60	2.80
Well	2.25	2.50	2.75

Pans— Dripping—

Standard List ..... 60@5@60&10%

Fry—

Common Lipped:

No.	1	2	3	4	5
Per doz.	$0.95	1.05	1.15	1.30	1.65

Roasting and Baking—

Regal, S. S. & Co., ₱ doz., Nos. 5, $4.50; 10 $5.25; 20 $5.75; 30, $6.25.
Simplex, ₱ doz.:

No.	40	50	60	140	150	160
	$2.75	3.25	3.75	3.00	3.25	4.00

Paper—Building Paper—

Asbestos: lb.
Building Felt 2¾c
Mill Board, sheet, 40 x 40 inches 3½c
Mill Board, roll, thicker than 1-16 inch 3½c
Mill Board, roll, 1-16 in. thick and less 2½c
Per roll
Rosin Sized Sheathing: 500 sq. ft.
Light wt., 25 lbs. to roll .. $0.45@0.50
Medium wt., 30 lbs. to roll .. $0.58@0.55
Heavy wt., 40 lbs. to roll .. $0.68@0.75
Black Water Proof Sheathing, 500 Sq ft., 1 ply, 65c; 2 ply, 85c; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb., ton $55.00
Red Rope Roofing, 250 sq. feet per roll $1.65
NOTE.—*These goods are often sold at delivered prices.*

Tarred Paper.

1 ply (roll 300 sq. ft.), ton .. $15 50@37.00
2 ply, roll 198 sq. ft ..... 60@65c
3 ply, roll 148 sq. ft ..... 85@90c
Slater's Felt (roll 500 sq. ft.) 75c
NOTE.—*Above prices often include delivery.*
R. R. M. Stone Surfaced Roofing (roll 110 sq. ft.) $2.75

Sand and Emery—

Flint ..... 60@60&10%
Garnet ..... 25@20@15%

Parers— Apple—

Advance ..... ₱ doz.
Baldwin ..... ₱ doz.
Bonanza Improved ..... each
Dandy ..... each
Eureka Improved ..... each
Family Bay State ..... ₱ doz.
Improved Bay State ..... ₱ doz.
New Lightning ..... ₱ doz.
Reading 72 ..... ₱ doz.
Reading 78 ..... ₱ doz.
Turn Table '98 ..... ₱ doz.
White Mountain ..... ₱ doz.

Potato—

Saratoga ..... ₱ doz.
White Mountain ..... ₱ doz.

Picks and Mattocks—

List Feb. 23, 1899 .. 60@10@60@10@10%

Pinking Irons—

See *Irons, Pinking.*

Pins— Escutcheon—

Brass ..... 60@60@10%
Iron, list Nov. 11, '85 ..... 60@60@10%

Pipe, Cast Iron Soil—

Standard, 2-6 in ..... 50@10%
Extra Heavy, 2-6 in 65%
Fittings 70%

Pipe, Merchant,

Steel or Iron, Carload Lots.

	f. o. b. Pittsburgh.	
Merchant Pipe.	*Black.*	*Galvanized.*
⅛, ¼, ⅜ inch	68%	58%
½-inch	70%	60%
¾ to 6 inch	75%	65%
7 to 12 inch	69%	59%

Less than carloads, 12½% advance.

Pipe Sewer—

Jobbers' Prices—
Standard Pipe and Fittings, 2 to 24 in.
New England 70%
New York and New Jersey 75%
Maryland, Delaware, East Penn. 75%
West Penn and West Va 70%
Virginia 78%
Ohio, Michigan and Ky 78%
Carload lots are generally delivered.

Pipe, Stove—

Edwards' Nested Stove Pipe:

	C. L.	L. C. L.
5 in., per 100 joints	$7.50	$8 50
6 in., per 100 joints	8.00	9.00
7 in., per 100 joints	9.00	10.00

Planes and Plane Irons—

Wood Planes—

Bench, First quality ..... 40@5@40@10%
Bench, Second qual ..... 60@5@50@10%
Molding ..... 33⅓@5@33⅓@10%
Bailey's (Stanley R. & L. Co) 5&10@25&10&10%
Chapin-Stephens Co.:
Bench, First Quality ..... 40@40&10%
Bench, Second Quality ..... 50@50&10%
Molding ..... 33⅓@33⅓&10%
Toy and German ..... 40@40&10%
Gage Self Setting 35%
Union 60%

Iron Planes—

Bailey's (Stanley R. & L. Co) ..... 25&10@25&10&10%
Chaplin's Iron Planes ..... 50&10%
Miscellaneous Planes (Stanley R. & L. Co.) ..... 20&10@20&10&10%
Sargent's 60%
Union 60%

Plane Irons—

Wood Bench Plane Irons ..... 30@5@30@10%
Buck Bros 30%
Chapin-Stephens Co ..... 30@30&10%
Stanley R. & L. Co ..... 20&10@20&10&10%
L. & I. J. White ..... 20&5@25%

Planters, Corn, Hand.

Kohler's Eclipse ..... ₱ doz. $8.50

Plates—

Felloe ..... lb. 3¾@4c
Self-Sealing Pie Plates (S. S. & Co.), ₱ doz. $2.00 ..... 50%

Pliers and Nippers—

Button Pliers ..... 75@75@10%
Gas Burner, per doz., 5 in., $1.50@ $1.20; 6 in., $1.35@$1.45

Gas Pipe	7	8	10	12-in.
	$1.75	$2.00	$2.75	$3.75

Acme Nippers ..... 50@50&5%
Bernard's:
Parallel, Pliers 35%
Paragon Pliers ..... 50&5%
Lodi Pliers ..... 30&5%
Elm City Fence Pliers 35%
Cronk & Carrier Mfg. Co.:
American Button ..... 75&10%
Cronk's 70%
Improved Button ..... 70&10%
Stub's Pattern 30%
Combination and others 30%
Heller's Farriers' Nippers, Pincers and Tools 40&10@40& 5%
P., S. & W. Tinners' Cutting Nippers ..... 30@30&10%
Swedish Side, End and Diagonal Cutting Pliers 30%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 30%

Plumbs and Levels—

Chapin Stephens Co.:
Plumbs and Levels ..... 30@30&10%
Chapin's Imp. Brass Cor 40@40@10%
Pocket Levels ..... 30@30@10%
Level Glasses ..... 60@60@10%
Disston's Plumbs and Levels 30%
Disston's Pocket Levels 30%
C. E. Jennings & Co.'s Iron 25%
C. E. Jennings & Co.'s Iron, Adjustable 30%
Stanley R. & L. Co .. 30&10@30&10&10%

Stanley's Duplex.....20@20&10@10%
Woods' Extension.....33⅓%

Poachers, Egg—

Buffalo Steam Egg Poachers, ₱ doz., No. 1, $8.00; No. 2, $ .00; No. 3, $ .00; No. 4, $12.00.....50%

Points, Glaziers'—

Bulk and 1 lb. papers..lb. 8¾c@..
½-lb. papers.....lb. 9¼c@..
¼-lb. papers.....lb. 9½c@..

Pokes, Animal—

Ft. Madison Hawkeye.....₱ doz. $3.25
Ft. Madison Western.....₱ doz. $4.00

Police Goods—

Manufacturers' Lists.....25@25&5%
Tower's.....25%

Polish—Metal—

Prestoline Liquid, No. 1 (¼ pt.), ₱ doz. $3.00; No. 2 (1 qt.), $9.72.....40%
Prestoline Paste.....40&10%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₱ doz. 50¢; ₱ gr. $4.50; ½ lb boxes, ₱ doz. $1.25; 1 lb boxes, ₱ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₱ doz., $1.25; ₱ gr. $12.00.
Barkeepers' Friend Metal Polish, ₱ doz. $1.75; ₱ gr. $18.00.
Wynn's White Silk, ¼ pt. cans, ₱ doz.....$2.00

Stove—

Black Eagle Benzine Paste, 5 lb cans.. ₱ lb 10¢
Black Eagle, Liquid, ½ pt. cans ₱ doz. 75¢
Black Jack Paste, ¾ lb cans, ₱ gro. $9.00
Ladd's Black Beauty, gr. $10.00.....50¢
Joseph Dixon's, ₱ gr. $5.75.....
Dixon's Plumbago.....₱ lb 8¢
Fireside.....₱ gr. $2.50
Gem, ₱ gr. $4.50.....10¢
Japanese.....₱ gr. $3.50
Jet Black.....₱ gr. $3.50
Peerless Iron Enamel, ½ pt. cans..... ₱ doz. $1.50
Wynn's:
Black Silk, 5 lb pail.....each 70¢
Black Silk, ½ lb box.....₱ doz. $1.00
Black Silk, 5 oz. box.....₱ doz. $0.75
Black Silk, ½ pt. liq.....₱ doz. $1.00

Poppers, Corn—

1 qt., Square.....gro. $9.00
1 qt., Round.....gro. $10.00
1½ qt., Square.....gro. 11.00
2 qt., Square.....gro. 13.00

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts, each.....$1.30

Potato Parers—

See *Parers, Potato.*

Pots— Glue—

Enameled.....40%
Tinned.....35%

Powder—

In Canisters:
Duck, 1 lb. each.....45c
Fine Sporting, 1 lb. each.....75c
Rifle, ½-lb. each.....15c
Rifle, 1-lb. each.....25c
King's Semi-Smokeless:
Keg (25 lb bulk).....$6 50
Half Keg (12½ lb bulk).....$3.50
Quarter Keg (6¼ lb bulk).....$1.90
Case 24 (1 lb cans bulk).....$8.50
Half case (1 lb cans bulk).....$4 50

King's Smokeless:	Shot Gun	Rifle
Keg (25 lb bulk)	$12 00	$15.00
Half Keg (12½ lb bulk)	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)	14.00	17 00
Half case 12 (1 lb cans blk)	7.25	8 75

Robin Hood Shot Gun.....50&20%

Presses—Fruit and Jelly—

Enterprise Mfg. Co.....20@25%
Sensible.....33⅓%
2 qt., $2.00; 4 qt., $4.00; 10 qt., $6.00 each.

Seal Presses—

Morrill's No. 1, per doz. $20.00.....50%
Morrill's No. 2, per doz. $22 50.....50%

Pruning Hooks and Shears—See *Shears.*

Pullers Nail—

Cyclops.....50%
Miller's Falls, No. 3, per doz. $12.00.....33⅓&10%
Pearson No. 1, Cyclone Spike Puller, each $37.50.....50%
Pelican, ₱ doz. $9.00.....40&10%
Scranton, Case Lots:
No. 1 (large), ₱ doz. $6.50; No. 2 (large), $5.75; No 3 (small), $5.00; No. 2-B (large), $5.50; No. 3-B (small), $5.00; No. 2-D (large), $4.50; No 3-D (small) $4.00.
Smith & Hemenway Co.:
Ajax.....60%
Diamond B, No. 2, case lots, ₱ doz $6.00
Diamond B, No. 3, case lots, ₱ doz $5.50
Eureka.....50%
Giant, No. 1, ₱ doz. $18; No. 2, $16.50; No. 3, $15.....40%
Yankee.....66⅔%

Pulleys—Single Wheel—

Inch	*2*	*2¼*	*3*
Awning...doz	*$0.55*	*.85*	*1.15*

Hay Fork, Swivel or Solid Eye..... doz., 4 in., $1.15, 5 in., $1.40

Inch	*2*	*2¼*	*2½*
Hot House, doz	*$0.70*	*.90*	*1.25*
Inch	*1¼*	*1½*	*1¾*
Screw.....doz	*$0.16*	*.19*	*.23*
Inch	*1¼*	*2*	*2¼*
Side.....doz	*$0 30*	*.40*	*.55*
Inch	*1½*	*1¾*	*2*
Tackle....doz	*$0.30*	*.42*	*.58*

2½ .63 1.00

Stowell's:
Ceiling or End, Anti-Friction.....60%
Dumb Waiter, Anti-Friction...60&10%
Hay Fork, Anti-Friction, 5-in. Wheel, ₱ doz. $12.00.....50%
Electric Light.....60%
Side, Anti-Friction.....60&10%

Sash Pulleys—

Common Frame; Square or Round End, per doz., 1¾ and 2 in...16@19c
Auger Mortise, no Face Plate, per doz. 1¾ and 2 in.....16@19c
Auger Mortise, with Face Plate, per doz., 1¾ and 2 in.....16@19c
Acme.....1¾ in., 16¢; 2 in., 19¢
Common Sense, 1¾ in.... ₱ doz., 18¢; 2 in., 20¢.
Fox-All-Steel, Nos. 3 and 7, 2 in. ₱ doz 25¢
Grand Rapids All Steel Noiseless....50%
Ideal No. 13.....1¾ in., ₱ doz., 16¢
Niagara.....1¾ in., 16¢; 2 in., 19¢
No. 20, Troy....1¾ in., 14½¢; 2 in., 16½¢
Star.....1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See *Blocks.*

Pumps—

Cistern.....60@60&10%
Pitcher Spout.....75&10@80%
Wood.....50@50&10%
Pump Leathers, Lower and Plunger Valves—Per gro.:

Inch..	*2*	*2¼*	*2½*	*2¾*
	$2.20	*2.50*	*2.75*	*3.00*
Inch..	*3*	*3¼*	*3½*	*3¾*	*4*
	$3.30	*3.60*	*3.85*	*4.10*	*4.40*

Barnes Dbl. Acting (low list).....50%
Contractors' Rubber Diaphragm No. 2 B. & L. Block Co.....$16.00
Flint & Walling's Fast Mail (low list).55¢
Flint & Walling's Pitcher Spout.....75%
Loud's Suction Pumps, U. H. Co.....20%
Myer's Pumps, low list.....50%
Myers' Power Pumps.....50%
Daisy Spray Pump.....₱ doz. $7.50
Myers' Spray Pumps.....50&10%

Punches—

Saddlers' or Drive, good..doz. 65@70c
Spring, single tube, good quality... $1.75@2.00
Revolving (4 tubes)...doz. $3.75@4.00
Bemis & Call Co.'s Cast Steel Drive....50%
Bemis & Call Co.'s Check.....55%
Bemis & Call Co.'s Spring.....50%
Morrill's No. 1 (A. B. C.), ₱ doz., $15.00..50%
No. 2, ₱ doz. $22.50.....50%
No. 2, Metal, ₱ doz., $45.00.....50%
Bench Punch, each, $ 0.00 ... .50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Steel Screw, B & K. Mfg. Co.....40%
Tinners' Hollow, P. S. & W. Co..35@35&5%
Tinners' Solid, P. S. & W. Co., ₱ doz., $1.44.....60%

Rail— Barn Door, &c.—

Cast Iron, Barn Door: Flange Screw Holes for Rd. Groove Wheels:

½	¾	¾	*In.*
$1.70	$2.10	$3 00	*100 feet.*

Angular for Sq. Groove Wheels:

Small	*Med.*	*Large.*	
$1.60	*1 95*	*2.70*	*100 feet.*

Sliding Door, Brnzed Wr't Iron, ft. 6½c
Sliding Door, Iron Painted...2½@3c
Sliding Door, Wrought Brass, 1¼ in.....lb. 56c...50%
Allith Mfg. Co. Reliable Hanger Track ₱ foot.....10¢
Cronk's Double Braced Steel Rail, ₱ foot.....3½¢
Cronk's O. N. T. Rail.....3½¢
Lanes' O. N. T., ₱ 100 ft., 1 inch, $4.10; 1¼ inch, $4.90; 1½ inch, $4.85.
Lanes' Standard, ₱ 100 ft.....8.75
Lawrence Bros.'.....₱ ft. 4½¢
Lawrence Bros. New York.....3½¢
McKinney's Hinged Hanger Rail ₱ foot, 11¢.....50%
McKinney's None Better.....₱ ft. 3½¢
McKinney's Standard.....₱ ft. 4 ¢
Myers' Stayon Track.....50&10%
Smith's Wrought Bracket, Plain.....3½¢
Smith's Special.....4½¢
Smith's Never Jump, per ft. 11¢.....50%
Smith's Plain Steel.....30%
Smith's Milled Steel.....4½¢
Stowell's Cast Rail.....1½¢
Stowell's Steel Rail, Plain.....25%
Stowell's Wrought Bracket, Plain.....3½¢
Swett's Hylo, per ft. 11¢.....50&10%
Swett's P. L. B. Steel Rail, ₱ 100 ft. $3.00

Rakes—

Net Prices, Malleable Rakes:

	10	*12*	*14*	*16-tooth*
Shank	*$1.50*	*1.60*	*1.75*	*1.85*
Socket	*$1.65*	*1.80*	*1.95*	*2.10*

Steel, August 1, 1899, List...70&5&20%
Malleable.....70&10@75&5%
Lawn Rakes, Metal Head, per doz., 20 teeth.....$3.25@3.50
24 teeth.....$3.60@3.75
Fort Madison Red Head Lawn.....$3 25
Fort Madison Blue Head Lawn.....$3.00
Jackson Lawn, 29 and 30 teeth, ₱ doz $4.00
Kohler's:
Lawn Queen, 20-tooth, ₱ doz.....$3.45
Lawn Queen, 24-tooth, ₱ doz $3.60
Paragon, 20 tooth, ₱ doz $2.75
Paragon, 24-tooth, ₱ doz.....$3.00
Steel Garden, 14-tooth, ₱ doz.....$2.88
Malleable Garden, 14-tooth, ₱ doz..$2.00

Rasps, Horse—

Disston's.....75%
Heller Bros.....70&5&10&10&5%
McCaffrey's American Standard ..... 60&10&5%
New Nicholson.....70&10%
See also *Files.*

Razors—

Borasic.....60 & 10%
Fox Razors, No. 42.. ₱ doz. $20.00 } dis.
Fox Razors, No. 44.. ₱ doz, $20.00 } 40%
Fox Razors, No. 82, Platina, ₱ doz. } –25.00
Red Devil.....60%
Silberstein:
Carbo Magnetic.....$18.00
Griffon, No. 65.....$15.00
Griffon, No. 00.....$12.00
All other Razors.....40%
Safety Razors.....40%

Safety Razors—

New Gem, in Tin Boxes.....₱ doz. $12.00
New Gem, Extra Blades.....₱ doz. $8.35
Gem Outfits (Razor, Strop, etc.)..... ₱ doz. $5.60
Complete Razor, extra Blade in Leather Case.....₱ doz. $27.00

Reels— Fishing—

Bishop's Independent Fish Reel Spooler, ₱ doz.....$30.00
Hendryx:
M 6, Q 6, A 6, B 6, M 9¼ 4008, Silver Rubber Populo, Nickeled Populo, Aluminum, German Silver, Bronze, 3 04 N, 06 N, 4 N to 8 PN.....33⅓%
6 RW 102 P and RN, 202 P and PN.40%
G 9.....20%
24 N to 28 PN.....35&10&10%
124 N, 974 PN, 002904 PN, 1020 R and PRN, 202 PR and PRN... 50&5%
2904 N.....40&10&5%
5009 PN and N..... 50%
2904 P.....50&10&5%
2904 PN.....60%
0925 N.....40&10%
02084 N.....45&12½&5%
Single Action Trout.....40&10%
986 P N, 802 and 802 N.....50&10%
Competitor, 304 and 304 PN.....35%
06304 P and PN.....40&5%
Safety and Salmon.....30%

Registers—*List July 1, 1903.*

Black Jap.....
White Jap.....
Bronzed..... } 70@75 & 10%
Nickel Plated.....
Electro Plated.....

Registers, Cash—

Sun, No. 10, Metal Cabinet.....$30.00
Sun, No. 10, Wood Cabinet.....$25.00

Revolvers—

Single Action.....65@90c
Double Act'n, except 44 cal..$1.00@1.60
Double Action, 44 caliber..$1.75@1.95
Automatic.....$3.25@3.50
Hammerless.....$3.75@4.10

Riddles, Hardware Grade

16 in., per doz.....$2.25@2.50
17 in., per doz.....$2.50@2.75
18 in., per doz.....$2.75@3 00

Rings and Ringers—

Bull Rings—

	2	*2½*	*3 Inch.*
Steel	*$0.70*	*0.75*	*0.80 doz.*
Copper	*1.00*	*1.10*	*1.35 doz.*

Hog Rings and Ringers—

Hill's Rings...gro. boxes, $4.25@4.50
Hill's Ringers, Gray Iron, doz. 55@60c
Hill's Ringers, Mal. Iron, doz. 75@80c
Blair's Rings.....per gro. $5.00@5.25
Blair's Ringers...per doz. $0.60@ .65
Brown's Rings....per gro. $5.50@5.75
Brown's Ringers...per doz. $0.75@1.00

Rivets and Burrs—

Copper.....50&10@50&10&5%
Iron or Steel:
Tinners'.....75@75&10%
Miscellaneous.....75@75&10%

Rollers—

Acme, Stowell's Anti-Friction.....50%
Barn Door, Sargent's list.....60%
Cronk's Stay.....66⅔%
Cronk's Brinkerhoff.....66⅔%
Lane's Stay.....33⅓&5%
Stowell's Barn Door Stay.....₱ doz. $1.25

Rope—

Manila, 7-16 in. and larger, tarred or untarred...lb. 11½@12 c
Manila, ⅜-inch ... lb. 12 @12½c
Manila, ¼ & 5-16 in....lb. 12½@13 c
Manila, Hay, Hide and Bale Ropes, Medium and Coarse ... lb. 11½@12 c
Sisal, 7-16 in. and larger lb. 8¼@ 9¼c
Sisal, ⅜-inch ... lb. 8¼@10 c
Sisal, ¼ and 5-16 inch..lb. 9¼@10 c
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse..... lb. 8¼@10 c
Sisal, Tarred, Medium Lath Yarn.....lb. 8¼@ 9½c
Cotton Rope:
Best..... ¼-in. and larger, lb. 16 c
Medium..¼-in. and larger, lb. 14 c
Com ... ¼-in. and larger, lb. 10 c
Jute Rope:
Thread No. 1, ¼-in. and up, lb. 6½c
Thread No. 2, ¼-in. and up, lb. 6 c
Yarn, ¼-in. and up..... lb. 5½c
Old Colony Manila Transmission Rope, ₱ lb 17½¢

Wire Rope—

Galvanized.....40&5%
Plain.....45&5%

Ropes, Hammocks—

Covert Mfg. Co.:
Jute.....40&5%
Sisal.....30%
Covert Saddlery Works.....60&5%

Rules—

Boxwood.....60&10@60&10&5%
Ivory.....35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood.....60@60&10%
Ivory.....35&35&10&10%
Miscellaneous.....50@50&10&10%
Combination.....55@55&10%
Stationers'.....10@10&10%
Lufkin's Steel.....50&10%
Lufkin's Lumber.....60&10%
Stanley R. & L. Co.:
Boxwood.....60@60&10%
Ivory.....35@35&10&10%
Upson Nut Co.:
Boxwood.....60@60&10%
Ivory.....35&10@35&10&10%

Sash Locks—See *Locks, Sash*

Sash Weights—

See *Weights, Sash.*

Sausage Stuffers or Fillers

—See *Stuffers or Fillers, Sausage*

Saw Frames—See *Frames, Saw*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins:
Circular.....50@50&10%
Band.....50&10@60%
Cross Cuts.....35&5%
Mulay, Mill and Drag.....50&10%
One-Man Saw.....40%
Wood Saws.....40%
Hand, Compass, &c.....40%
Chapin-Stephens Co.:
Turning Saws and Frames.. 30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws.....25%
Disston's:
Circular, Solid and Inserted Tooth..50%
Band, 3 to 14 in wide.....60%
Band, ⅛ to 2⅜.....70%
Crosscuts.....45%
Narrow Crosscuts.....50%
Mulay, Mill and Drag.....50%
Framed Woodsaws.....35%
Woodsaw Blades.....35%
Woodsaw Rods.....25%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 79, 77, 8.....25%
Hand Saws, Nos 7, 107, 107½, 3, 1, 0, 00, Combination.....30%
Compass, Keyhole, &c.....25%
Butcher Saws and Blades.....35%
C. E. Jennings & Co.'s:
Back Saws.....25&10%
Butcher Saws.....30&10%
Compass and Key Hole Saws..35&5&10%
Framed Wood Saws.....30&10%
Hand Saws.....20&2½&10%
Wood Saw Blades.....30&10%
Millers Falls:
Butcher Saws.....15&10%
Star Saw Blades.....15&10%
Peace:
Circular and Mill.....50%
Cross Cuts, list Jan. 1, '99.....50%
Hand, Panel and Rip.....30%
Richardson:
Circular and Mill.....50%
Hand, &c.....30%
X Cuts, list Jan. 1, '99.....50%
Simonds':
Circular Saws.....50%
Crescent Ground Cross Cut Saws..35%
One-Man Cross Cuts.....40&10%
Gang Mill, Mulay and Drag Saws..50%
Band Saws.....50%
Back Saws.....25&25&7½%
Butcher Saws.....35&35&2½%
Hand Saws.....25&2½&7½%
Hand Saws, Bay State Brand.....45%
Compass, Keyhole, &c .....25&25&7½%
Wood Saws .....35@35&2½%

Hack Saws—

Atkins' Hack Saw Blades A A A..... 30%
Disston:
Concave Blades.....25%
Keystone.....40%
Hack Saw Frames.....30%
Fitchburg File Works, The Best.....25%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180..... 35&5&10%
Hack Saws, Nos. 175, 180, complete, 35&5&10%
Griffin's Hack Saw Frames.. 35&5&10%
Griffin's Hack Saw Blades.....35&5&10%
Star Hack Saws and Blades.....15&10%
Sterling Hack Saw Blades.....25%
Sterling Hack Saw Frames.....20%

Scroll—

Barnes' No. 7, $15.....25%
Barnes' Scroll Saw Blades.....40%
Barnes' Velocipede Power Scroll Saw without boring attachment, $18; with boring attachment, $20.....30%
Lester, complete, $10.00.....15&10%
Rogers, complete, $4.00.....15&10%

Scalers, Fish—

Bishop's Lightning.....₱ doz. $3.00
Covert's Saddlery Works.....60&10%

Scales—

Family, Turnbull's.....30@30&10%
Counter:
Hatch, Platform, ½ oz to 48 lbs. doz. $5.50
Two Platforms, ½ oz to 8 lbs. doz. $16
Union Platform, Plain...$1.70@1.90
Union Platform, Striped $1.85@2.15
Chatillon's:
Eureka.....25%
Favorite.....40%
Grocers' Trip Scales.....50%
Chicago Scale Co.:
The "Little Detective," 25 lbs.....50%
Union or Family No. 2.....60%
Portable Platform (reduced list).....50%
Wagon or Stock (reduced list)... 25&35%
Pelouze Scales—Household, Counter, Candy, Ice, Postal, Computing.....50%
"The Standard" Portables.....45%
"The Standard" R. R. and Wagon.....50%

Scrapers—

Box, 1 Handle.....doz. $2.25@2.50
Box, 2 Handle.....doz. $3.00@3 50
Ship Light, $2.50; Heavy, $4.00
Adjustable Box Scraper (S. R. & L. Co.) $6.00.....30@30&10%
Chapin-Stephens Co., Box.....50@50&10%

Screens, Window, and Frames—

Flyer Pattern Window Screen...60@60&5%
Maine Window Screen Frames ..40&10&5%
Perfection Window Screens.....60@60&5%
Phillips' Window Screen Frames....60&5%
Porter's:
Fairview Window Screens ..... 60&5@60&5&2½%
Hummer Window Screens..... 60&5@60&5&2½%
Klondike Window Screens..... 6 &5@60&5&2½%
See also *Doors.*

CURRENT METAL PRICES.

AUGUST 19, 1903.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Refined Iron—	
1 to 1⅝ in. round and square	@2.05¢
1⅛ to 4 in. x ⅜ to 1 in	@2.05¢
1⅛ to 4 in. x ⅛ to 5-16	@2.25¢
Rods—⅜ and 11-16 round and square	@2.35¢
Angles:	Cts ₩ lb.
3 in. x ¼ in. and larger	2.30¢
3 in. x 3-16 in and ⅛ in	2.55¢
1½ to 2½ in. x ⅛ in	2.35¢
1½ to 2⅜ in. x 3-16 in and thicker	2.30¢
1 to 1¼ in. x 3-16 in	2.35¢
1 to 1¼ x ⅜ in	2.40¢
⅞ x ⅛ in	2.55¢
¾ x ⅛ in	2.65¢
⅝ x ⅛ in	3.45¢
½ x 3-32 in	3.95¢
Tees:	
1 in	2.80¢
1¼ in	2.60¢
1½ in. and larger	2.50¢
Beams	2.50@3.00¢
Channels, 3 in. and larger	2.50@3.00¢
Bands—1¼ to 6 x 3-16 to No. 8	₩ lb 2.40¢
"Burden's Best" Iron, base price	₩ lb 2.90¢
Burden's "H. B & S. Iron, base price	₩ lb 2.70¢
"Ulster"	₩ lb 3.15¢
Norway Bars	3.75@4.25¢
Norway Shapes	4.00@4.50¢

Merchant Steel from Store—

	per lb
Bessemer Machinery	2.10¢
Toe Calk, Tire and Sleigh Shoe	2.30@3.00¢
Best Cast Steel, base price in small lots	7¢

Soft Steel Sheets—

¼ inch	2.40¢	No. 14	2.70¢
3-16 inch	2.40¢	No. 16	2.80¢
No. 8	2.40¢	No. 18	3.00¢
No. 10	2.50¢	No. 20	3.00¢
No. 12	2.60¢	No. 22	3.10¢

Sheet Iron from Store.

Black.

	One Pass, C. R. Soft Steel	O. R. Cleaned
Nos. 14 to 16	₩ lb 2.80	3.0 ¢
Nos. 18 to 21	₩ lb 2.90	3.10¢
Nos. 22 to 24	₩ lb 3.00	3.2 ¢
Nos. 25 and 26	₩ lb 3.10	3.30¢
No. 27	₩ lb 3.20	3.40¢
No. 28	₩ lb 3.30	3.50¢

Russia, Planished, &c.

Genuine Russia, according to assortment ₩ lb 11¾@14¢

Patent Planished, ₩ lb A, 10¢; B, 9¢, net

Galvanized.

Nos. 14 to 16	₩ lb, 3.24¢
Nos. 18 to 20	₩ lb, 3.51¢
Nos. 22 to 24	₩ lb, 3.78¢
No. 26	₩ lb, 4.05¢
No. 27	₩ lb, 4.32¢
No. 28	₩ lb, 4.59¢
No 30	₩ lb, 5.67¢

No. 20 and lighter, 36 inches wide, 25¢ higher.

Foreign Steel from Store—

Best Cast	₩ lb 15 ¢
Extra Cast	₩ lb 18 @ 20 ¢
Swaged, Cast	₩ lb 16 ¢
Best Double Shear	₩ lb 15 ¢
Blister, 1st quality	₩ lb 13 ¢
German Steel, Best	₩ lb 10 ¢
2d quality	₩ lb 9 ¢
3d quality	₩ lb 8 ¢
Sheet Cast Steel, 1st quality	₩ lb 15 ¢
2d quality	₩ lb 14 ¢
3d quality	₩ lb 12 ¢
R. Mushet's "Special"	₩ lb 46 ¢
" " "Titanic"	₩ lb 10 ¢
Hobson's Choice XX Extra Best	₩ lb 35 ¢
Jessop Self Hardening	₩ lb 45 ¢
Seamans' "Nelson" Steel	40 ¢
Hobson's "Soho" Special Self-Hardening	₩ lb 43 ¢

METALS—

Tin—

Duty.—Pigs, Bars and Block. Free. Per lb

Banca, Pigs	29¼@29⅜¢
Straits, Pigs	29¼@29⅜¢
Straits in Bars	30 @30½¢

Tin Plates—

American Charcoal Plates.

Calland Grade:	
IC, 14 x 20	$8.75
IX, 14 x 20	8.25
Melyn Grade:	
IC, 14 x 20	6.50
IX, 14 x 20	7.75
Allaway Grade:	
IC, 14 x 20	5.50
IX, 14 x 20	6.60

American Coke Plates—Bessemer—

IC, 14 x 20 108 lb	$4.60@4.70
IX, 14 x 20	$5.90@6.15

American Terne Plates—

IC, 20 x 28	$9.00
IX, 20 x 28	$11.00

Copper—

Duty: Pig, Bar and Ingot and Old Copper free. Manufactured, 2½¢ ₩ lb.

Ingot—

Lake	14@14⅛¢
Casting	13½@14¢

Sheet and Bolt—

March 12, 1903. Net.

Prices, in cents per pound. Sheet 30 x 60.

Not wider than	Not longer than	And longer than	64 oz. & over, 50 lb. sheet, 30 x 60 and heavier.	32 oz. to 64 oz., 25 to 50 lb.	24 oz. to 32 oz., 18¾ to 25 lb.	16 oz. to 24 oz., 12½ to 18¾ lb.	14 oz. and 15 oz., 11 to 12½ lb.	12 oz. and 13 oz., 9½ to 11 lb.	10 oz. and 11 oz., 7¾ to 9½ lb.	8 oz. and 9 oz., 6¼ to 7¾ lb.	Lighter than 8 oz.
Ins.	Ins.	Ins.									
30	72	.....	20	21	21	22	22	23	24	27	30
30	96	72	20	21	21	22	22	24	27	30	
30	.....	96	20	21	21	21	23	27			
36	72	.....	20	21	21	21	23	25	28	31	
36	96	72	20	21	21	21	23	27	30		
36	120	96	20	21	21	22	24				
36	.....	120	20	21	20	23					
48	72	.....	20	21	20	23	25	28	31		
48	96	72	20	21	20	24	26	29			
48	120	96	20	21	23	25	29				
48	.....	120	20	22	24	27					
60	72	.....	20	21	22	24	27	32			
60	96	72	20	21	23	25	30				
60	120	96	20	22	24	27					
60	.....	120	21	23	25	29					
72	96	.....	20	22	24	29					
72	120	96	20	23	26	31					
72	.....	120	21	24	29						
108	96	.....	21	24	27						
108	120	96	22	25	28						
108	.....	120	23	26	30						
wider than 108	132	.....	24	27							
	.....	132	25	26							

Rolled Round Copper, ⅜ inch diameter and over, ₩ lb 20¢.

Circles, Segments and Pattern Sheets, 3¢ ₩ lb advance over price of sheet Copper required to cut them from.

Cold or Hard Rolled Copper 14 oz. ₩ square foot and heavier, 1¢ ₩ lb over the foregoing prices.

Cold or Hard Rolled Copper lighter than 14 oz. ₩ square foot, 2¢ ₩ lb over the foregoing prices.

All Polished Copper, 20 in. wide and under 1¢ ₩ lb advance over the price for Cold Rolled Copper.

All Polished Copper, over 20 in. wide, 2¢ ₩ lb advance over the price for Cold Rolled Copper.

Planished Copper—

1¢ ₩ lb more than Polished Copper.

Copper Bottoms, Pits and Flats—

14 oz. to square foot and heavier, ₩ lb	24¢
12 oz. and up to 14 oz. to square foot, ₩ lb	26¢
10 oz. and up to 12 oz., ₩ lb	27¢
Lighter than 10 oz., ₩ lb	28¢
Circles less than 8 in. diameter, 2¢ ₩ lb additional	
Circles over 13 in. diameter are not classed as Copper Bottoms.	
Polished Copper Bottoms and Flats, 1¢ ₩ lb extra.	

Copper Wire—

Hard and Soft Drawn—B. & S. Gauge.

List Feb. 20, 1901.

Nos.	0000 to 8 Base	9 and 10		11 and 12
	¼¢	¼¢		¼¢ ₩ lb adv.
Nos.	13	14	15	16
	½¢	¾¢	1¢	1¼¢ ₩ lb adv.
Nos.	17	18	19	20
	1¼¢	2¢	2½¢	2¾¢ ₩ lb adv

Seamless Brass Tubes—

Standard always Stubs' gauge, unless otherwise ordered.

Feb. 6, 1899. Net. Outside Diameter.

Stubs' W.G.	B. & S. W.G.	¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1¼	1½
4-11	7- 9	..	.....	...	.....	33	31	30	29	28	27	25	24
12	10	..	.....	37	35	33	31	30	29	28	27	25	24
13	11	..	.....	37	35	33	31	30	29	28	27	25	24
14	12	..	41	37	35	33	31	30	29	28	27	25	24
15	13	..	42	38	36	33	32	31	30	30	28	26	25
16	14	..	43	39	37	34	33	32	31	31	29	26	25
17	15	..	44	4	38	35	34	33	32	31	30	27	26
18	16	61	46	42	39	36	35	34	32	31	30	28	27
19	17	62	47	44	40	37	36	35	34	33	32	30	29
20	18-19	64	49	44	41	39	38	37	36	35	34	32	31
21	20	76	51	46	43	41	40	39	38	37	36	35	34
22	21	77	56	48	44	42	41	40	39	38	37	37	36
23	22	78	64	53	46	44	43	42	41	40	39	39	39
24	23	81	66	53	48	46	45	44	43	41	40	40	41
25	24	86	71	56	51	49	47	46	45	43	43	44	45

Copper Bronze and Gilding Tube, 3¢ ₩ lb additional

Iron Pipe Sizes—Brass

⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6 inch
36	32	20	27	21	21	21	21	21	21	21	23	23	25	27	28₩lb

Copper, Bronze or Gilding Tubes, 3¢ ₩ lb additional

Brazed Brass Tubing.

(*To No. 19, inclusive.*) June 6, 1898.

Brown & Sharpe's gauge standard.

	Per lb.
Plain Round Tube, ¾ in. up to 2 in.	$0.35
" " ⅞ " " ¾ "	.36
" " 1 " " ⅞ "	.38
" " 1⅛ " " 1 "	.41
" " 1¼ " 5-16"	.48
" " 1½ " 5-16"	.65
" " 1¾ " ½ "	1.00
" " 2 " ⅝ " 3-16"	1.50
Smaller than ⅛ inch	Special
2 inch to 3 inch, to No. 19, inclusive	.38
3 inch	.40
Over 3 inch to 3½ inch, inclusive	.45
Over 3½ inch	.50

Bronze and Copper, advance on Brass List, 3 cents.

Discount from list 5% 25%

Roll and Sheet Brass—

(*Brown & Sharpe Standard Gauge.*)

Common High Brass.	in.	in.	in.	in.	in.	in.	in.	in.
Wider than	2	12	14	16	18	20	22	24
and including	12	14	16	18	20	22	24	26
To No. 20 inclusive	.23	.23	.25	.27	.29	.31	.33	.36
Nos. 21 22, 23 and 24	.22	.24	.26	.28	.30	.32	.34	.37
Nos. 25 and 26	.23	.24½	.27	.29	.31	.33	.35	.38
Nos. 27 and 28	.25	.25	.28	.30	.32	.34	.37	.39

Common High Brass.	in.	in.	in.	in.	in.	in.	in.
Wider than	26	28	30	32	34	36	38
and including	28	30	32	34	36	38	40
To No. 20, inclusive	.39	.42	.46	.50	.55	.60	.65
Nos. 21, 22, 23 and 24	.40	.43	.47	.51	.56	.61	.68
Nos. 25 and 26	.41	.44	.48	.52	.57	.63	.71
Nos. 27 and 28	.42	.45	.49	.53	.58	.65	.75

* Special prices not less than 80 cents.

Add ½¢ ₩ lb additional for each number thinner than Nos. 28 to 38 inclusive. Discount from List 25%

Wire in Coils. List February 26, 1896.

Brown & Sharpe's gauge the standard.	Com. high brass.	Low brass.	Gilding bronze and copper
All Nos. to No. 10, inclusive	$0.23	$0.27	$0.28
Above No. 10 to No. 16	.23½	.27½	.28½
No. 17 and No. 18	.24	.28	.32
No. 19 and No. 20	.25	.29	.33
No. 21	.26	.30	.34
No. 22	.27	.31	.35
No. 23	.28	.32	.36
No. 24	.30	.34	.38
No. 25	.32	.36	.40
No. 26	.35	.39	.43
No. 27	.38	.42	.46
No. 28	.42	.46	.51
No. 29	.45	.49	.54
No. 30	.48	.52	.62
No. 31	.51	.55	.67
No. 32	.55	.59	.73
No. 33	.59	.63	.82
No. 34	.64	.68	.95
No. 35	.70	.74	1.30
No. 36	.76	.80	1.50
No. 37	1.00	1.04	1.70
No. 38	1.30	1.34	2.00
No. 39	2.00	2.00	3.25
No. 40	2.60	2.60	5.75

Discount, Brass Wire, 25%; Copper Wire, Net. List November 16, 96.

Spring Wire, 2¢ ₩ lb advance.

Tobin Bronze—

Straight, but not turned, Rods, ⅝ to 3 in. diameter, ₩ lb, net 19¢

Finished Piston Rods, ⅝ to 2½ in. diameter, ₩ lb net, 20¢

Other sizes and extreme lengths, special prices.

Spelter—

Duty: In Blocks or Pigs, 1¢ ₩ lb

Western Spelter 6@6¼¢

Zinc.

Duty: Sheet, 2¢ ₩ lb.

No. 9, base casks 7¼¢ | Open, per lb 8¢

Lead.

Duty: Pigs and Bars and Old, 2½¢ ₩ lb. Pipe and Sheets, 2½¢ ₩ lb.

American Pig	4.60@4.70¢
Bar	5.45½¢
Pipe	5½@6½¢
Tin Lined Pipe	12½¢ 20% off
Block Tin Pipe	37½¢ net
Sheet Lead	6@6¼¢

Old Lead in exchange, 3¼¢ ₩ lb

Solder.

½ & ½, guaranteed	18½@19 ¢
No. 1	16 @ 7 ¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Duty, ¾¢ ₩ lb.

Cookson	7½¢
Hallett's	7 ¢
U. S.	6¾¢

Aluminum—

Duty: Crude, 8¢ ₩ lb. Plates, Sheets, Bars and Rods, 13¢ ₩ lb.

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting:	
Small lots	37¢
100-lb lots	35¢
No. 2 Aluminum (guaranteed to be over 90% pure), in ingots for remelting:	
Small lots	34¢
100-lb lots	33¢

Aluminum Wire, B. & S. gauge. 50 lb or more

Wider than	6-in.	14-in.	24-in.
And including	14-in.	24-in.	30-in.
	₩ lb.	₩ lb.	₩ lb
Nos. 13 to 19	$0.42	$0.44	$0.47
No. 20	.44	.46	.49
Nos. 21 to 23	.46	.48	.51
No. 24	.46	.50	.53
No. 25	.47	.51	.54
No. 26	.47	.54	.56
No. 27	.48	.57	.62
No. 28	.48	.57	.64
No. 29	.49	.60	.69
No. 30	.50	.64	.77

Note.—Lots of less than 50 lb 5¢ ₩ lb extra.

Aluminum Wire, B. & S. Gauge.

Larger than No. 9 ₩ lb 40¢	No. 15 ₩ lb 43¢
No. 9 to No. 10 ₩ lb 40 ¢	No. 17 ₩ lb 50¢
No. 11 ₩ lb 41 ¢	No. 18 ₩ lb 55¢
No. 12 ₩ lb 41½¢	No. 19 ₩ lb 60¢
No. 13 ₩ lb 42 ¢	No. 20 ₩ lb 65¢
No 14 ₩ lb 42½¢	No. 21 ₩ lb 80¢

Old Metals.

Dealers' Purchasing Prices Paid in New York.

Heavy Copper	₩ lb 13½¢
Light and Tinned Copper	₩ lb 10¢
Heavy Brass	₩ lb 7¢
Light Brass	₩ lb 5½¢
Lead	₩ lb 4¢
Tea Lead	₩ lb 3¢
Zinc	₩ lb 4 ¢
No. 1 Pewter	₩ lb 18 ¢
No. 2 Pewter	₩ lb 8 ¢
Pure Aluminum, Sheet	₩ lb
Cast Aluminum	₩ lb
Tin Plate Scrap	₩ ton $4.50
Wrought Scrap Iron	₩ gross ton $14.00@14
Heavy Cast Scrap	₩ gross ton $13.50@14
Stove Plate Scrap	₩ gross ton $8.00@
Burnt Iron	₩ gross ton $7.50@